Environmental Assessment of the 445th Airlift Wing Conversion from C-141C to C-5 Aircraft at Wright-Patterson Air Force Base, OH

Headquarters Air Force Reserve Command

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ABBREVIATIONS AND ACRONYMS

°F	degrees Fahrenheit
445 AW	445th Airlift Wing
88 ABW	88th Air Base Wing
ACM	asbestos-containing materials
AFB	Air Force Base
AFI	Air Force Instruction
AFOSH	Air Force Occupational and Environmental Safety, Fire Protection, and Health Program
AFPD	Air Force Policy Directive
AFRC	Air Force Reserve Command
AFSC	Air Force Safety Center
AGE	Aerospace Ground Equipment
AGL	above ground level
AICUZ	Air Installation Compatible Use Zone
APE	Area of Potential Effect
APZ	accident potential zone
AQCR	Air Quality Control Region
AR	aerial refueling
ARB	Air Reserve Base
ART	Air Reserve Technician
ASC	Aeronautical Systems Center
AST	aboveground storage tank
ATC	air traffic control
BAM	Bird Avoidance Model
BAI	Backup Aircraft Inventory
BASH	Bird/Wildlife Aircraft Strike Hazard
BMP	Best Management Practice
CAA	Clean Air Act
CEQ	Council on Environmental Quality
CFR	Code of Federal Regulations
CO	carbon monoxide
CWA	Clean Water Act
CZ	clear zone
dB	decibel
dBA	A-weighted decibel
DNL	day-night average A-weighted sound level
DOD	Department of Defense
DLSME	Defense Land Systems and Miscellaneous Equipment
DP&L	Dayton Power and Light
EA	Environmental Assessment
EIAP	Environmental Impact Analysis Process
EIFS	Economic Impact Forecast System
EIS	Environmental Impact Statement
EO	Executive Order
ERP	Environmental Restoration Program
ESA	Endangered Species Act
ESQD	Explosive Safety Quantity Distance
ESZ	Explosive Safety Zone
FAA	Federal Aviation Administration
FEMA	Federal Emergency Management Agency
FICON	Federal Interagency Committee on Noise
FLIP	Flight Information Publication
FONPA	Finding of No Practicable Alternative
FONSI	Finding of No Significant Impact
ft^2	square feet
FY	Fiscal Year
GOV	government-owned vehicle
HAP	High Accident Potential
HAZMART	hazardous material pharmacy
HHS	U.S. Department of Housing and Urban Development
HUD	U.S. Department of Housing and Urban Development
I	Interstate
IICEP	Interagency and Intergovernmental Coordination for Environmental Planning
JP-8	Jet Propellant-8
KIAS	knots indicated airspeed
LBP	lead-based paint
m^2	square meters

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← *continued on front inside cover*

mg/m^3	milligrams per cubic meter
mph	miles per hour
MCD	Miami Conservancy District
MMBtu/hr	million British thermal units per hour
MSA	Metropolitan Statistical Area
MSL	mean sea level
MSW	municipal solid waste
MTR	military training route
NAAQS	National Ambient Air Quality Standards
NEPA	National Environmental Policy Act
NESHAP	National Emissions Standards for Hazardous Air Pollutants
NHPA	National Historic Preservation Act
NO_2	nitrogen dioxide
NOA	Notice of Availability
NOAA	National Oceanic and Atmospheric Administration
NO_x	nitrogen oxide
NPDES	National Pollutant Discharge Elimination System
NRCC	National Regional Climate Center
NRCS	Natural Resources Conservation Service
NRHP	National Register of Historic Places
NSR	New Source Review
NWI	National Wetlands Inventory
O_3	ozone
ODH	Ohio Department of Health
OEPA	Ohio Environmental Protection Agency
OSHA	Occupational Safety and Health Administration
OU	Operable Unit
PAA	Primary Assigned Aircraft
Pb	lead
$PM_{2.5, 10}$	particulate matter less than or equal to 2.5 or 10 microns
POL	petroleum, oil, and lubricants
ppm	parts per million
POV	privately owned vehicle
PSD	Prevention of Significant Deterioration
RAPCA	Regional Air Pollution Control Agency
RCRA	Resource Conservation and Recovery Act
ROI	Region of Influence
SARA	Superfund Amendments and Reauthorization Act
SEL	sound exposure level
SHPO	State Historic Preservation Office
SIP	State Implementation Plan
SMAQMD	Sacramento Metropolitan Air Quality Management Division
SO_2	sulfur dioxide
SR	State Route
SWPPP	Storm Water Pollution Prevention Plan
TGO	touch-and-go operation
TMDL	total maximum daily load
tpy	tons per year
TSD	Treatment, Storage, and Disposal
U.S.C.	United States Code
USACE	U.S. Army Corps of Engineers
USAF	U.S. Air Force
USBAM	U.S. Bird Avoidance Model
USDA-WS	U.S. Department of Agriculture-Wildlife Services
USEPA	U.S. Environmental Protection Agency
USFWS	U.S. Fish and Wildlife Service
UST	underground storage tank
VOC	volatile organic compound
yd^2	square yards
$\mu g/m^3$	micrograms per cubic meter

FINDING OF NO SIGNIFICANT IMPACT (FONSI)
AND
FINDING OF NO PRACTICABLE ALTERNATIVE (FONPA)

ENVIRONMENTAL ASSESSMENT (EA)
OF THE 445th AIRLIFT WING CONVERSION
FROM C-141C TO C-5 AIRCRAFT
AT WRIGHT-PATTERSON AIR FORCE BASE, OHIO

INTRODUCTION

The Air Force Reserve Command (AFRC) is proposing an aircraft replacement for the 445th Airlift Wing (445 AW) based at Wright-Patterson Air Force Base (AFB), Ohio. The 445 AW currently possesses 16 C-141Cs Primary Assigned Aircraft (PAA). The 16 C-141C aircraft would be replaced by 10 C-5s PAA and 1 C-5 backup aircraft inventory (BAI). A total of 11 C-5 aircraft would be stationed at Wright-Patterson AFB. The 16 C-141C aircraft would be retired over the next several years. The drawdown of C-141C aircraft is scheduled to begin in Fiscal Year (FY) 2005. The aircraft conversion, if implemented, would begin in FY06 and end in FY07. The Proposed Action would provide the necessary base infrastructure modifications and personnel changes to enable 445 AW aircrews to perform readiness training operations and ensure that resupply mission requirements for C-5 aircraft are met and sustained.

PURPOSE OF AND NEED FOR THE PROPOSED ACTION

An airlift fleet with new capabilities, able to move forces over intercontinental distances and deliver them directly to where they are required, is needed to provide rapid deployment of personnel and equipment. The purpose of the aircraft conversion is to provide AFRC with a replacement for the existing C-141C aircraft, which is scheduled for retirement in FY06. The replacement of the C-141C aircraft with the C-5 aircraft is needed to maintain AFRC's airlift capabilities and the 445 AW's current military and humanitarian missions. The conversion of the C-141C aircraft to the C-5 aircraft would also allow the United States Air Force (USAF) to retain hundreds of skilled aircrew and aircraft maintenance personnel.

DESCRIPTION OF THE PROPOSED ACTION AND ALTERNATIVES

Proposed Action. The Proposed Action consists of four parts at Wright-Patterson AFB: (1) aircraft changes, (2) construction activities, (3) changes in personnel and (4) changes of operations.

The Proposed Action involves the replacement of the 445 AW's 16 retiring C-141Cs PAA at Wright-Patterson AFB with 10 C-5s PAA and 1 C-5 BAI. For analysis, only 10 C-5s PAA are evaluated because the 1 C-5 BAI would only operate if one or more PAAs were unable to fly. The number of C-141C aircraft would steadily draw down from FY05 through FY06. Under the Proposed Action, C-5 aircraft would begin arriving at Wright-Patterson AFB for basing in FY 06. The last C-5 aircraft would arrive in the second quarter of FY07.

The Proposed Action would involve the construction, modification and removal of several facilities and buildings at Wright-Patterson AFB. AFRC has identified the need for 10 construction projects to support the proposed beddown of C-5 aircraft. The construction projects would replace existing inadequate facilities and upgrade capabilities necessary to perform required activities.

Changes in personnel would occur as a result of the proposed aircraft conversion. While there would be no change in the number of Air Reserve Technician (ART) officer authorizations, the proposed program manpower authorizations for ART enlisted personnel would increase by 137. Drill Officers would decrease by 13 authorizations, and Drill Enlisted would increase by 49 authorizations.

Operations that would be performed by the C-5 aircraft would be similar to current operations performed by the C-141C aircraft. No low-level military airspace would be utilized by the 445 AW. Use of established airspace with a base altitude of 3,000 feet above ground level (AGL) does not require environmental analysis in accordance with the USAF Environmental Impact Analysis Process (EIAP), 32 Code of Federal Regulations (CFR) 989, as amended.

The 445 AW currently conducts approximately 8,638 annual airfield operations using C-141C aircraft at Wright-Patterson AFB. Under the Proposed Action, C-5 aircraft would conduct approximately 4,000 airfield operations, representing a 53.7 percent decrease.

Alternatives to the Proposed Action. As part of the National Environmental Policy Act (NEPA) process, potential alternatives to the Proposed Action must be evaluated. Two alternatives to the Proposed Action were considered to determine their feasibility as a viable alternative to beddown of C-5 aircraft at Wright-Patterson AFB. These alternatives are as follows:

- Conversion to C-17 Aircraft – The C-17 Globemaster III is a heavy-lift, air-refuelable, cargo and troop transport aircraft. Designed to support both inter- and intra-theater operations, the aircraft affords direct delivery airlift of all classes of military cargo, including outsized items such as armored

vehicles. It is the first aircraft capable of air-landing or air-dropping outsized cargo in the tactical environment. The availability of C-17 airframes depends primarily on the Department of Defense purchasing schedule. Wright-Patterson AFB could not receive C-17 aircraft before the scheduled retirement of the C-141C aircraft, which would leave the 445 AW without an active mission. Therefore, in order to maintain the airlift mission of the 445 AW, conversion to C-17 aircraft is not a viable alternative at this time and would not be carried forward for analysis.

- Conversion to C-130E aircraft – The C-130E is an extended-range development of the C-130B with large under-wing fuel tanks. It can perform a large range of missions, but is primarily used for the tactical portion of the airlift mission. There are no C-130E aircraft available in the USAF inventory that could be relocated to Wright-Patterson AFB. Therefore, the conversion to C-130E aircraft at Wright-Patterson AFB would not be carried forward for further analysis.

No Action Alternative. Under the No Action Alternative, the strategic airlift mission at Wright-Patterson AFB would continue until the remaining C-141C aircraft are retired or their useful life is extended. Replacement of these aircraft by C-5 aircraft would not occur. The C-141C aircraft would drawdown as set by the current schedule. The C-141C operations at Wright-Patterson AFB would continue flying until FY06. By that time, the C-141C would no longer be able to be supported with spare parts, and the C-141C fleet at Wright-Patterson AFB would be retired. All other missions operating at Wright-Patterson AFB would remain. AFRC aircraft at other bases would require increased flying time to make up for the lost capability once supported by the C-141C aircraft at Wright-Patterson AFB.

SUMMARY OF ANTICIPATED ENVIRONMENTAL IMPACTS ASSOCIATED WITH THE PROPOSED ACTION

Analysis of the Proposed Action indicates that the affected environment would not be significantly impacted by proceeding with the Proposed Action. However, adverse impacts would occur on air quality, geological resources, water resources, biological resources, and cultural resources.

Air Quality (EA, Section 4.4). The Proposed Action would result in increased nitrogen oxide emissions, which would contribute to increased ground-level ozone concentrations. However, nitrogen oxide emissions would not increase above *de minimis* levels, and a Conformity Determination (Appendix C of the EA) is not required. In addition the Wright-Patterson AFB Title V permit would need to be

modified to include the upgrades to the fuel handling and dispensing systems, relocation of the aircraft spot painting operation and installation of natural gas heating boilers during building construction and renovations.

Geological Resources (EA, Section 4.6). Minor, short-term impacts on geological resources would be expected from construction and demolition activities that result in soil disturbance. Standard erosion control (e.g., such as silt fencing, sediment traps, application of water sprays and revegetation at disturbed areas) would reduce potential impacts.

Water Resources (EA, Section 4.7). Minor, short-term impacts on surface water and groundwater would occur from runoff during construction. Best management practices, such as sediment fencing during active construction and revegetation of exposed areas immediately following construction, would confine runoff to the construction site and reduce the potential for increased water turbidity. In addition, the 88th Air Base Wing (ABW) and 445 AW would be required to submit an Ohio Environmental Protection Agency National Pollutant Discharge Elimination System General Permit for the various construction activities insuring sediment and erosion control measures are in place. As a result of these measures, surface water quality would be comparable to preconstruction conditions.

Aircraft operations would also contribute to adverse impacts on water resources.Aircraft deicing currently results in large quantities of propylene glycol entering surface water bodies, which contributes to decreased dissolved oxygen in those water bodies. The Proposed Action would not be expected to increase the amount of deicing fluid. The 88 ABW and 445 AW have not decided how to capture a larger quantity of deicing fluid, but a resolution would occur over the next few years.

A large portion of Wright-Patterson AFB lies within the Mad River floodplain. Most of Area C is behind Huffman Dam and subject to flooding. The 10-year floodplain is at 804.7 feet above mean sea level (MSL), and the 100-year floodplain is at 814.3 feet above MSL. The Miami Conservancy District controls the flood protection system in the Great Miami River Watershed and has the right to back water upon and over the property upstream of Huffman Dam.

Minor adverse impacts would result from the Proposed Action. Portions of the parking apron are located in the 100-year floodplain. Two construction projects (1 and 4) entail modifications to the parking apron that would impact the floodplain.Project 1 consists of widening the existing parking apron to provide parking for the larger C-5 aircraft. Project 4 would include replacement of pavement sections to accommodate C-5 loading. Pursuant to Miami Conservancy

District policies and correspondence, any fill material required must come from within the floodplain to ensure no net gain or loss of soils within the retention basin. All other proposed construction projects are located adjacent the 100-year floodplain. The current configuration of the C-141C apron and aircraft maintenance buildings is in or adjacent to the 100-year floodplain. No additional, practical alternatives were identified that would meet the objectives of the Proposed Action. Adverse impacts, such as increased impervious surfaces, would be reduced using appropriate storm water detention measures. There would be no significant adverse impacts on floodplains under the Proposed Action.

Biological Resources (EA, Section 4.8). Minor, short-term impacts on vegetation would occur as a result of the Proposed Action during construction and demolition activities. Following construction activities, effected areas would be mulched and revegetated with native plants to prevent non-native, invasive plant growth.

A coordination letter was sent to U.S. Fish and Wildlife Service. While several federally protected species occur in and around Wright-Patterson AFB, the Proposed Action would not impact these species or their known habitat. In addition, no wetlands would be impacted by the Proposed Acton.

Cultural Resources (EA, Section 4.9). The proposed construction program requires interior modifications to the Flight Simulator Building (Building 152), which is eligible for the National Register of Historic Places. The 88 ABW has undergone consultation (Appendix A of the EA) with the Ohio State Historic Preservation Officer (SHPO) regarding the proposed interior modifications. The SHPO concurs with a conditional finding of no adverse effect assuming the USAF submits all project documentation, including plans, specifications and photographs to the Ohio SHPO for review and approval prior to taking action.

PUBLIC REVIEW AND INTERAGENCY COORDINATION

Based on the provisions set forth in the Proposed Action, all activities were found to comply with the criteria or standards of environmental quality and coordinated with the appropriate Federal, state and local agencies. The EA and a draft of this Finding of No Significant Impact/Finding of No Practicable Alternative (FONSI/FONPA) were made available to the public on 22 June 2004, for a 30-day review period. Two comments were received expressing concern about low-approaching aircraft. These comments were addressed in Section 4.5.2 and are presented in Appendix A of the EA.

FINDINGS

Finding of No Practicable Alternative. Reasonable alternatives were considered, but no other alternative to the Proposed Action meets the safety or operational requirements of the 445 AW. Pursuant to Executive Orders 11988 and 11990 and the authority delegated by Secretary of the Air Force Order (SAFO) 791.1, and taking the above information into account, I find that there is no practicable alternative to this action and that the Proposed Action includes all practicable measures to minimize harm to the environment. This decision has been made after taking into account all submitted information, and considering a full range of practical alternatives that will meet project requirements and are within the legal authority of the USAF.

Finding of No Significant Impact. After review of the EA prepared in accordance with the requirements of the National Environmental Policy Act (NEPA), the Council on Environmental Quality (CEQ) regulations, and EIAP, 32 CFR 989, as amended, I have determined that the Proposed Action will not have a significant impact on the quality of the human or natural environment and, therefore, an Environmental Impact Statement (EIS) does not need to be prepared. This decision has been made after taking into account all submitted information, and considering a full range of practical alternatives that will meet project requirements and are within the legal authority of the USAF.

6 September 2004

JOHN J. BATTLE, JR.
Major General, USAF
Vice Commander, AFRC

Date

6 Oct 04

RICHARD V. REYNOLDS
Lieutenant General, USAF
Vice Commander, AFMC

Date

COVER SHEET

ENVIRONMENTAL ASSESSMENT OF THE 445TH AIRLIFT WING CONVERSION FROM C-141C TO C-5 AIRCRAFT AT WRIGHT-PATTERSON AIR FORCE BASE, OHIO

Responsible Agencies: U.S. Air Force (USAF), Air Force Reserve Command (AFRC), 445 Airlift Wing (445 AW), Wright-Patterson Air Force Base (AFB), Ohio

Affected Location: Wright-Patterson AFB, Ohio

Proposed Action: 445 AW conversion from C-141C aircraft to C-5 aircraft

Report Designation: Environmental Assessment (EA)

Written comments and inquiries regarding this document should be directed to Mr. Tom Perdue, EIAP Program Manager, 88 ABW/EMO, 5490 Pearson Road, WPAFB, OH 45433-5332, (937) 257-5532, thomas.perdue@wpafb.af.mil or Susan Murphy, 88 ABW/PA, 1865 4th Street, Wright-Patterson AFB, OH 45433-7129, (937) 255-1840, susan.murphy@wpafb.af.mil.

Abstract: AFRC is proposing an aircraft replacement for the 445 AW based at Wright-Patterson AFB, Ohio. The 445 AW currently possesses 16 C-141C Primary Assigned Aircraft (PAA). The 16 C-141C aircraft would be replaced by 10 C-5 PAA and 1 C-5 Backup Aircraft Inventory (BAI). A total of 11 C-5 aircraft would be stationed at Wright-Patterson AFB. For analysis, 10 C-5 PAA are evaluated because 1 C-5 BAI would only operate if one or more PAA were unable to fly. The 16 C-141C aircraft will be retired over the next several years. The drawdown of C-141Cs is scheduled to begin in Fiscal Year (FY) 2005. The aircraft conversion, if implemented, would begin in FY 06 and end in FY 07. The Proposed Action would provide the necessary base infrastructure modifications and personnel changes to enable 445 AW aircrews to perform readiness training operations and ensure that resupply mission requirements for C-5 aircraft are met and sustained.

This EA evaluates the Proposed Action and the No Action Alternative. Resources considered in the impact analysis are airspace management, noise, land use, air quality, safety, geological resources, water resources, biological resources, cultural resources, socioeconomics and environmental justice, infrastructure, and hazardous materials and wastes. Analyses in this document identify several minor adverse impacts on floodplains, water resources, geological resources, and air quality resulting from the proposed construction activities related to the base infrastructure modifications and the operation of the C-5 aircraft. The EA was made available to the public on June 22, 2004, for a 30-day review period.

ENVIRONMENTAL ASSESSMENT OF THE 445TH AIRLIFT WING CONVERSION FROM C-141C TO C-5 AIRCRAFT AT WRIGHT-PATTERSON AIR FORCE BASE, OHIO

HEADQUARTERS, AIR FORCE RESERVE COMMAND
ENVIRONMENTAL DIVISION
255 RICHARD RAY BOULEVARD
ROBINS AIR FORCE BASE, GEORGIA 31098-1637

AUGUST 2004

ENVIRONMENTAL ASSESSMENT OF THE 445TH AIRLIFT WING CONVERSION FROM C-141C TO C-5 AIRCRAFT AT WRIGHT-PATTERSON AFB, OHIO

TABLE OF CONTENTS

APPENDICES

LIST OF FIGURES

LIST OF TABLES

TABLE **PAGE**

1. Purpose of and Need for the Proposed Action

This section includes five subsections: a brief background description of the Proposed Action, a statement of the purpose of and need for the Proposed Action, the location of the Proposed Action, a summary of the key environmental compliance requirements, and an overview of the organization of this Environmental Assessment (EA).

1.1 Background

The U.S. Air Force (USAF) has determined that it is necessary to replace the aging C-141C Starlifter aircraft. The Air Force Reserve Command (AFRC) is proposing an aircraft replacement for the 445th Airlift Wing (445 AW) based at Wright-Patterson Air Force Base (AFB), Ohio. The 445 AW currently possesses 16 C-141C Primary Assigned Aircraft (PAA), which would be replaced by 10 C-5 PAA and 1 C-5 Backup Aircraft Inventory (BAI). A total of 11 C-5 aircraft would be stationed at Wright-Patterson AFB. Depending on aircraft availability and other external factors, either the C-5A model or the C-5B model would be beddown at Wright-Patterson AFB. The 16 C-141C aircraft will be retired over the next several years. The drawdown of C-141C aircraft is scheduled to be completed in the third quarter of Fiscal Year (FY) 2006.

This EA analyzes AFRC's Proposed Action and the No Action Alternative. If the analyses presented in the EA indicate that implementation of the Proposed Action would not result in significant environmental impacts, a Finding of No Significant Impact (FONSI) would be prepared. A FONSI briefly presents reasons why a Proposed Action would not have a significant effect on the human environment and why an Environmental Impact Statement (EIS) is unnecessary. If significant environmental issues result that cannot be mitigated to insignificance, an EIS would be required, or the Proposed Action would be abandoned and no action would be taken.

1.2 Purpose of and Need for the Proposed Action

An airlift fleet with new capabilities, able to move forces over intercontinental distances and deliver them directly to where they are required, is needed to provide rapid deployment of personnel and equipment. The purpose of the aircraft conversion is to provide AFRC with a replacement for the existing C-141C aircraft, which is scheduled for retirement in FY 06. The replacement of the C-141C aircraft with the C-5 aircraft is needed to maintain AFRC's airlift capabilities and the 445 AW's current military and humanitarian missions. The conversion of the C-141C aircraft to the C-5 aircraft would also allow the USAF to retain hundreds of skilled aircrew and aircraft maintenance personnel.

1.3 Location of the Proposed Action

Wright-Patterson AFB is in the southwest portion of the state of Ohio in Greene and Montgomery counties, approximately 10 miles east of the city of Dayton. The base encompasses 8,145 acres and is classified as nonindustrial with mixed development. Wright-Patterson AFB is subdivided into three areas: Areas A, B, and C (see Figure 1-1 below). Areas A and C (primarily administrative offices and active airfield, respectively) are adjacent to one another. Area B (primarily research and development with educational functions) is across State Route (SR) 444 to the southwest. The 445 AW occupies an area near the western ramp of Area C. Figure 1-2 shows the location of Wright-Patterson AFB and the surrounding area.

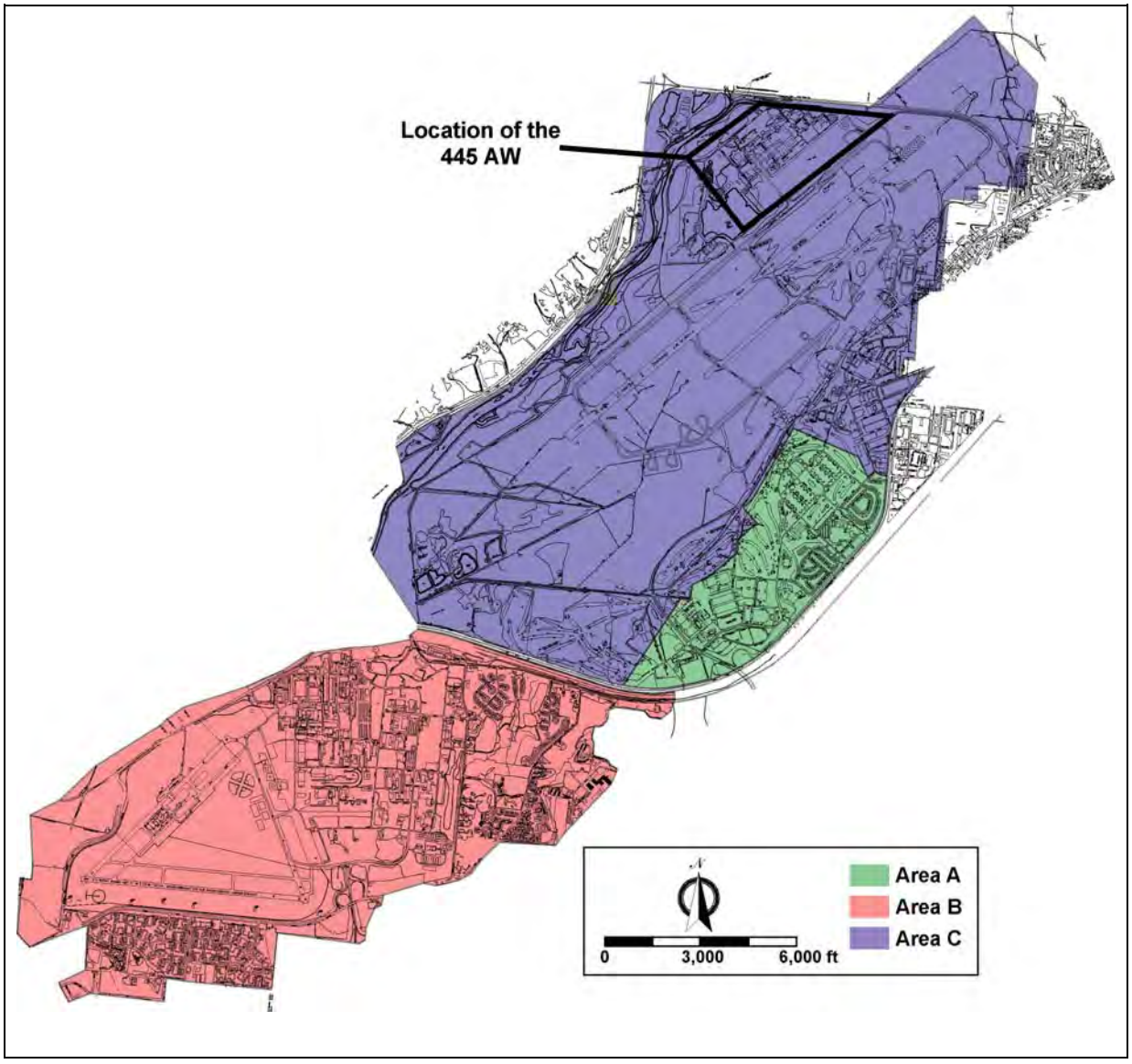

Figure 1-1. Areas A, B, and C on Wright-Patterson AFB

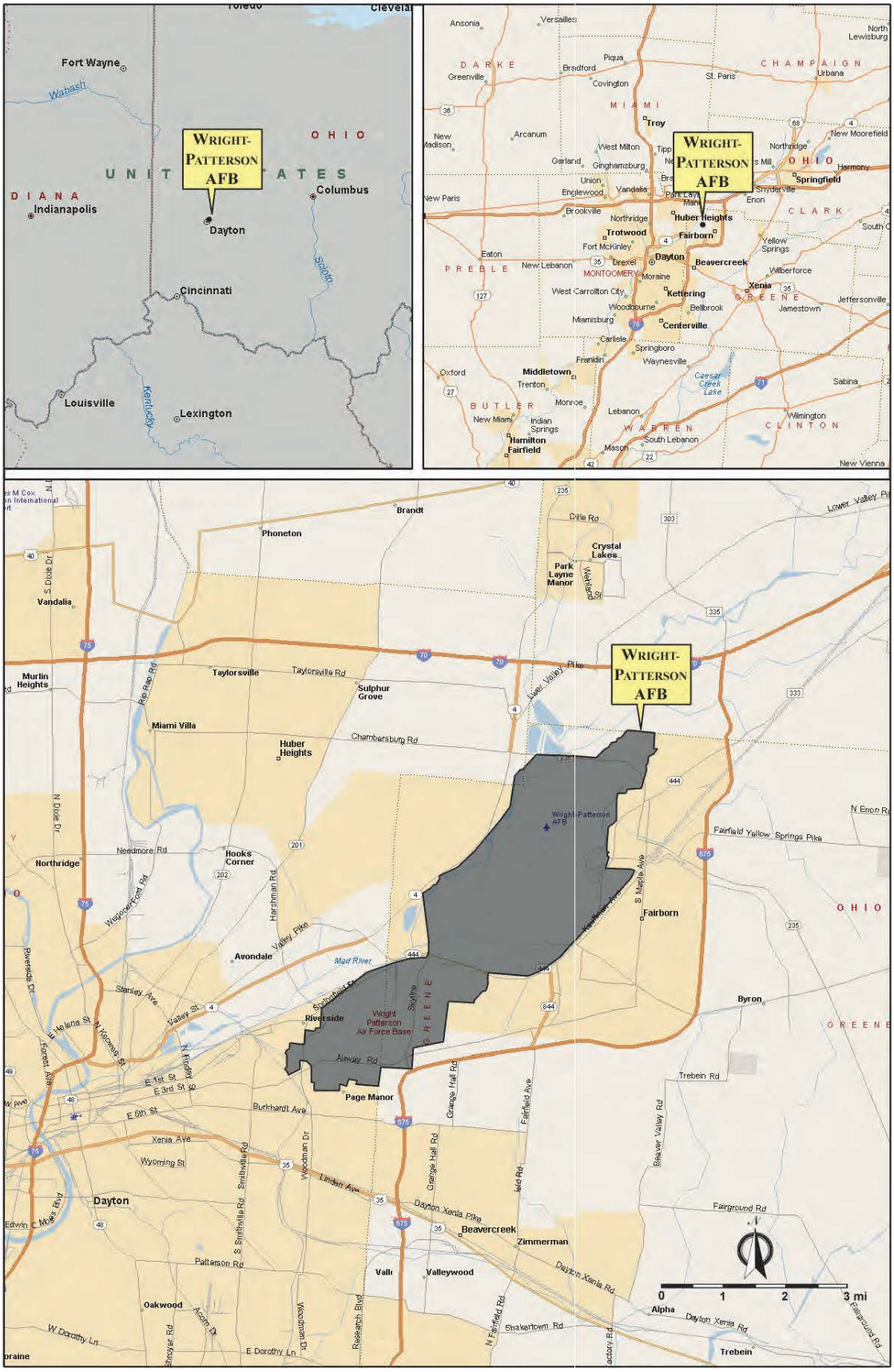

Figure 1-2. Location of Wright-Patterson AFB and Surrounding Area

1.4 Summary of Key Environmental Compliance Requirements

1.4.1 National Environmental Policy Act

The National Environmental Policy Act (NEPA) (42 United States Code [U.S.C.] §§ 4321–4347) is a Federal statute requiring the identification and analysis of potential environmental impacts of proposed Federal actions before those actions are taken. NEPA mandates a structured approach to environmental impact analysis that requires Federal agencies to use an interdisciplinary and systematic approach in their decisionmaking process. This process evaluates potential environmental consequences associated with a proposed action and considers alternative courses of action. The intent of NEPA is to protect, restore, or enhance the environment through well-informed Federal decisions.

The process for implementing NEPA is codified in Title 40 of the Code of Federal Regulations (CFR), Parts 1500–1508, *Regulations for Implementing the Procedural Provisions of the National Environmental Policy Act*. The Council on Environmental Quality (CEQ) was established under NEPA to implement and oversee Federal policy in this process. CEQ regulations specify the reasons to prepare an EA:

- Briefly provide evidence and analysis for determining whether to prepare an EIS or a FONSI
- Aid in an agency's compliance with NEPA when an EIS is unnecessary
- Facilitate preparation of an EIS when one is necessary

Air Force Policy Directive (AFPD) 32-70, *Environmental Quality*, states that the USAF will comply with applicable Federal, state, and local environmental laws and regulations, including NEPA. The USAF's implementing regulation for NEPA is *The Environmental Impact Analysis Process* (EIAP), 32 CFR Part 989, as amended.

1.4.2 Integration of Other Environmental Statutes and Regulations

To comply with NEPA, the planning and decisionmaking process for actions proposed by Federal agencies involves a study of other relevant environmental statutes and regulations. The NEPA process, however, does not replace procedural or substantive requirements of other environmental statutes and regulations. It addresses them collectively in the form of an EA or EIS, which enables the decisionmaker to have a comprehensive view of major environmental issues and requirements associated with the Proposed Action. According to CEQ regulations, the requirements of NEPA must

be integrated "with other planning and environmental review procedures required by law or by agency so that all such procedures run concurrently rather than consecutively."

The EA examines potential effects of the Proposed Action and the alternative on 12 resource areas: airspace management, noise, land use, air quality, safety, geological resources, water resources, biological resources, cultural resources, socioeconomics and environmental justice, infrastructure, and hazardous materials and wastes. The following paragraphs present examples of relevant laws, regulations, and other requirements that are often considered as part of the analysis. Table 1-1 contains potentially applicable permits, licenses, or entitlements.

Noise

Land use guidelines established by the U.S. Department of Housing and Urban Development (HUD) and based on findings of the Federal Interagency Committee on Noise (FICON) recommend acceptable levels of noise exposure for land use.

Land Use

Air Force Instruction (AFI) 32-7063, the *Air Installation Compatible Use Zone* (AICUZ) program, provides guidance to air bases and local communities in planning land uses compatible with airfield operations. The AICUZ program describes existing aircraft noise and flight safety zones on and near USAF installations.

Air Quality

The Clean Air Act (CAA) (42 U.S.C. §§ 7401–7671g) establishes Federal policy to protect and enhance the quality of the nation's air resources to protect human health and the environment. The CAA requires that adequate steps be implemented to control the release of air pollutants and prevent significant deterioration in air quality. The 1990 amendments to the CAA require Federal agencies to determine the conformity of proposed actions with respect to State Implementation Plans (SIPs) for attainment of air quality goals.

Safety

AFI 91-202, *The USAF Mishap Prevention Program*, implements AFPD 91-2, *Safety Programs*. It establishes mishap prevention program requirements (including the Bird/Wildlife Aircraft Strike Hazard [BASH] Program), assigns responsibilities for program elements, and contains program management information. This instruction applies to all USAF personnel, including AFRC.

Table 1-1. Potentially Required Federal Permits, Licenses, or Entitlements for Wright-Patterson AFB

Federal Permit, License, or Entitlement	Applicability of Permit, License, or Entitlement	Authority	Regulatory Agency	Responsible Organization
Title V operating permit program under the Clean Air Act (CAA) (see Sections 3.4 and 4.4 of EA)	Sources subject to the Title V permit program include • Any major source: (1) A stationary source that emits or has the potential to emit 100 tons per year (tpy) of any pollutant (major source threshold can be lower in nonattainment areas) (2) A major source of air toxics regulated under Section 112 of Title III (sources that emit or have the potential to emit 10 tpy or more of a hazardous air pollutant or 25 tpy or more of any combination of hazardous air pollutants) • Any "affected source" as defined in Title IV (acid rain) of the CAA • Any source subject to New Source Performance Standards under Section 112 of the CAA • Source required to have new source or modification permits under Parts C (Prevention of Significant Deterioration [attainment areas]) or D (New Source Review [nonattainment areas]) • Any source subject to standards, limitations, or other requirements under Section 112 of the CAA • Other sources designated by U.S. Environmental Protection Agency (USEPA) in the regulations	Title V of CAA, as amended by the 1990 CAA Amendments	USEPA, Ohio Environmental Protection Agency (OEPA)	88 ABW/EM

Table 1-1. Potentially Required Federal Permits, Licenses, or Entitlements for Wright-Patterson AFB (continued)

Federal Permit, License, or Entitlement	Applicability of Permit, License, or Entitlement	Authority	Regulatory Agency	Responsible Organization
National Pollutant Discharge Elimination System permit (see Sections 3.7 and 4.7 of EA)	Discharge of pollutant from any point source into waters of the United States	Section 402 of the Clean Water Act, 22 U.S.C. § 1342	USEPA, OEPA	88 ABW/EM
Endangered Species Act, Section 10 permit (see Sections 3.8 and 4.7 of EA)	Taking endangered or threatened wildlife species, engaging in certain commercial trade of endangered or threatened plants or removing such plants on property subject to Federal jurisdiction	Section 10 of Endangered Species Action, 16 U.S.C. 1539; 50 CFR Part 17	U.S. Fish and Wildlife Service	88 ABW/EM
National Historic Preservation Act consultation (see Sections 3.9 and 4.9 of EA)	Excavation or removal of archaeological resources, modifications or removal of historic properties	Section 106 of the National Historic Preservation Act	National Park Service, Ohio Historical Society	88 ABW/EM

AFI 91-301, *Air Force Occupational and Environmental Safety, Fire Protection, and Health Program* (AFOSH), implements AFPD 91-3, *Occupational Safety and Health*. The purpose of AFOSH is to minimize loss of USAF resources and to protect USAF personnel from occupational deaths, injuries, or illnesses by managing risks. In conjunction with AFI 91-202, *The USAF Mishap Prevention Program*, these standards ensure all USAF workplaces meet Federal safety and health requirements. This instruction applies to all USAF activities, including those of the AFRC.

Water Resources

The Clean Water Act (CWA) of 1977 and the Water Quality Act of 1987 (33 U.S.C. § 1251, et seq., as amended) establish Federal policy to restore and maintain the chemical, physical, and biological integrity of the nation's waters and, where attainable, to achieve a level of water quality that provides for the protection and propagation of fish, shellfish, and wildlife, and recreation in and on the water. The CWA requires the USEPA to establish water quality standards for specified contaminants in surface waters and forbids the discharge of pollutants from a point source into navigable waters without a National Pollutant Discharge Elimination System (NPDES) permit.

Section 404 of the CWA establishes a Federal program to regulate the discharge of dredge and fill material into waters of the United States. Section 404 permits are issued by the U.S. Army Corps of Engineers (USACE). Waters of the United States include interstate and intrastate lakes, rivers, streams, and wetlands which are used for commerce, recreation, industry, sources of fish, and other purposes. Each agency should consider the impact on water quality from actions such as the discharge of dredge or fill material into U.S. waters from construction, or the discharge of pollutants as a result of facility occupation.

Executive Order (EO) 11988, *Floodplain Management*, requires Federal agencies to take action to reduce the risk of flood damage; minimize the impacts of floods on human safety, health, and welfare; and restore and preserve the natural and beneficial values served by floodplains. Federal agencies are directed to consider the proximity of their actions to or within floodplains. Where information is unavailable, agencies are encouraged to delineate the extent of floodplains at their site. New construction in a floodplain must apply accepted floodproofing and flood protection to include elevating structures above the base flood level rather than filling in land.

Biological Resources

The Endangered Species Act (ESA) (16 U.S.C. § 1531, et seq.) requires Federal agencies that fund, authorize, or implement actions to avoid jeopardizing the continued existence of federally listed threatened or endangered species, or destroying or adversely affecting their critical habitat. Federal agencies must evaluate the effects of their actions through a set of defined procedures, which can include preparation of a Biological Assessment and formal consultation with the U.S. Fish and Wildlife Service (USFWS).

EO 11990, *Protection of Wetlands*, requires that Federal agencies provide leadership and take actions to minimize or avoid the destruction, loss, or degradation of wetlands and to preserve and enhance the natural and beneficial values of wetlands. Federal agencies are to avoid new construction in wetlands, unless the agency finds there is no practicable alternative to construction in the wetland, and the proposed construction incorporates all possible measures to limit harm to the wetland.

Cultural Resources

The National Historic Preservation Act (NHPA) of 1966 (16 U.S.C. §§ 470 et seq.) provides the principal authority used to protect historic properties; establishes the National Register of Historic Places (NRHP); and defines, in Section 106, the requirements for Federal agencies to consider the effects of an action on properties on or eligible for the NRHP.

Protection of Historic and Cultural Properties (36 CFR 800 [1986]) provides an explicit set of procedures for Federal agencies to meet their obligations under the NHPA, including inventory of resources and consultation with the appropriate State Historic Preservation Office (SHPO).

The Archaeological Resources Protection Act of 1979 (16 U.S.C. §§ 470 et seq.) ensures that Federal agencies protect and preserve archaeological resources on Federal or Native American lands and establishes a permitting system to allow legitimate scientific study of such resources.

EO 13007, *Indian Sacred Sites*, requires that, to the extent practicable, Federal agencies accommodate access to and ceremonial use of Indian sacred sites by Indian religious practitioners and avoid adversely affecting the physical integrity of such sacred sites.

EO 13084, *Consultation and Coordination with Indian Tribal Governments*, requires that each Federal agency have an effective process to permit elected officials and other representatives of Indian tribal governments to provide meaningful and timely input in the development of regulatory policies on matters that significantly or uniquely affect their communities.

Socioeconomics and Environmental Justice

EO 12898, *Federal Actions to Address Environmental Justice in Minority Populations and Low-Income Populations,* directs Federal agencies to assess the effects of their actions on minority and low-income populations within their region of influence (ROI). Agencies are encouraged to include demographic information related to race and income in their analysis of the environmental and economic effects associated with their actions.

1.4.3 Interagency and Intergovernmental Coordination for Environmental Planning and Community Involvement

NEPA requirements help ensure that environmental information is made available to the public during the decisionmaking process and prior to actions being taken. The premise of NEPA is that the quality of Federal decisions will be enhanced if proponents provide information to the public and involve the public in the planning process. CEQ regulations implementing NEPA specifically state, "There shall be an early and open process for determining the scope of issues to be addressed and for identifying the significant issues related to a proposed action. This process shall be termed scoping." The Intergovernmental Coordination Act and EO 12372, *Intergovernmental Review of Federal Programs,* require Federal agencies to cooperate with and consider state and local views in implementing a Federal proposal. AFI 32-7060 requires AFRC to implement a process known as Interagency and Intergovernmental Coordination for Environmental Planning (IICEP), which is used for the purpose of agency coordination and implements scoping requirements.

Through the IICEP process, AFRC notified relevant Federal, state, and local agencies of the action proposed and provided them the opportunity to make known their environmental concerns specific to the action. The IICEP process provides AFRC the opportunity to cooperate with and consider state and local views in implementing the Federal proposal. An IICEP letter was sent on January 20, 2004, to the Federal Aviation Administration (FAA); USEPA; USFWS; SHPO; and other Federal, state, and local agencies. The comment period lasted for 30 days, ending on February 20, 2004. Agency responses were provided to AFRC and incorporated into the analysis of potential environmental impacts performed as part of the EA. IICEP correspondence is included in Appendix A.

A Notice of Availability (NOA) for the EA and Draft FONSI/Finding of No Practicable Alternative (FONPA) was published in the *Dayton Daily News* on June 22, 2004, initiating the public review period. The EA and Draft FONSI/FONPA were made available in the Fairborn Public Library until July 22, 2004. During this time period, two public comments were received. The NOA and comments received are included in Appendix A.

1.5 Introduction to the Organization of this Document

The EA is organized into seven sections. Section 1 provides the purpose of and need for the Proposed Action. Section 2 contains a description of the Proposed Action and alternative. Section 3 contains a general description of the biophysical resources and baseline conditions that could potentially be affected by the Proposed Action or the No Action Alternative. Section 4 presents an analysis of the environmental consequences, and Section 5 includes an analysis of the potential cumulative impacts on Wright-Patterson AFB. Section 6 lists the preparers of the document. Section 7 lists the sources of information used in the preparation of the document. Appendix A of the EA includes a copy of the IICEP letter mailed to the agencies for this action, the IICEP distribution list, the NOA, and agency and public comments. Appendix B contains background information about noise metrics. Appendix C contains the Air Conformity Analysis. Appendix D contains all SHPO correspondence.

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2. Description of Proposed Action and Alternatives

This section has six subsections: an introduction to the Proposed Action, a detailed description of the Proposed Action, a description of the No Action Alternative, identification of alternatives eliminated from further consideration, identification of other actions announced near the project area at Wright-Patterson AFB, and a description of the decision to be made and identification of the preferred alternative.

2.1 Introduction

This section describes the alternatives AFRC is analyzing to accomplish the Proposed Action and presents the No Action Alternative, as prescribed by CEQ regulations. The Proposed Action would provide the necessary base infrastructure modifications that would enable 445 AW aircrews to perform readiness training operations and ensure that mission requirements for C-5 aircraft are met and sustained.

Several military missions are supported by the aircraft and personnel at Wright-Patterson AFB. The Aeronautical Systems Center (ASC) is the largest of four product centers in the Air Force Materiel Command, and is the host unit at Wright-Patterson AFB. The mission of the ASC is to rapidly deliver war-winning capability. ASC develops, acquires, modernizes, and sustains the world's best aerospace systems. The 88th Air Base Wing (88 ABW) supports and maintains Wright-Patterson AFB, acting as the landlord to more than 100 tenant organizations.

The 445 AW is an AFRC unit and a tenant at Wright-Patterson AFB. The mission of the 445 AW is to maintain operational readiness and provide strategic worldwide transport, including aeromedical evacuation. The 445 AW recruits and trains to attain these goals. The wing has rescued prisoners of war from Hanoi, Vietnam; flown humanitarian missions to Somalia and Rwanda; provided ground support in Bosnia; and transported military firefighters to western states to fight uncontrolled fires. Most recently, the 445 AW has been involved in Operation Enduring Freedom and Operation Iraqi Freedom. The 445 AW currently operates 16 C-141C aircraft.

2.2 Detailed Description of the Proposed Action

The Proposed Action consists of four parts at Wright-Patterson AFB: aircraft changes, construction activities, changes in personnel, and changes of operations. The Proposed Action is further detailed in the following subsections. Implementation of the Proposed Action is the preferred alternative.

2.2.1 Aircraft Changes at Wright-Patterson AFB

The Proposed Action involves the replacement of the 445 AW's 16 retiring C-141C PAA at Wright-Patterson AFB with 10 C-5 PAA and 1 C-5 BAI. For analytical purposes, the 10 C-5 PAA are evaluated because BAI are only flown when one or more aircraft is incapable of being flown. No more than 10 C-5 aircraft would be flown at any one time at Wright-Patterson AFB. The number of C-141C aircraft would steadily draw down from FY 05 through FY 06. Under the Proposed Action, C-5 aircraft would begin arriving at Wright-Patterson AFB for basing in FY 06. The last C-5 aircraft would arrive in the second quarter of FY 07. Table 2-1 shows the proposed C-141C drawdown and C-5 basing schedule.

Table 2-1. Proposed C-141C Drawdown and C-5 Basing Schedule

FY/Quarter	Total No. of C-141C PAA	Total No. of C-5 PAA
05/1	16	
05/2	14	
05/3	12	
05/4	8	0
06/1	8	2
06/2	8	4
06/3	4	6
06/4	0	8
07/1		9
07/2		10

Characteristics of C-141C Aircraft. The C-141C Starlifter fulfills the vast spectrum of airlift requirements through its ability to airlift combat forces over long distances; deliver those forces and their equipment either by air, land, or airdrop; resupply forces; and transport the sick and wounded from a hostile area to advanced medical facilities. The first C-141, delivered to Tinker AFB, Oklahoma, in October 1964, began squadron operations in April 1965. The C-141 has a changeable cargo compartment, which can transition from rollers on the floor for palletized cargo to a smooth floor for wheeled vehicles to aft facing seats or sidewall canvas seats for passengers, quickly and easily, to handle more than 30 different missions. The C-141 was the first jet transport from which U.S. Army paratroopers jumped, and the first to land in the Antarctic. A universal air refueling receptacle on the C-141C has the ability to transfer 23,592 gallons (89,649.6 liters) of fuel in about 26 minutes, allowing for longer nonstop flights and fewer fuel stops at overseas bases during worldwide

airlift missions. Four Pratt & Whitney TF33-P-7 turbofan engines, rated at 20,250 pounds of thrust each, power the C-141.

The C-141 force, nearing 11 million flying hours, has a proven reliability and long-range capability. In addition to training, worldwide airlift, and combat support missions, the C-141 has amassed an admirable record in response to humanitarian crises.

Characteristics of C-5 Aircraft. The C-5 aircraft, nicknamed "the Galaxy," is a heavy-cargo transport designed to provide airlift support for deployment and supply of combat. The gigantic C-5 aircraft, with its tremendous payload capability, provides the Air Mobility Command global airlift in support of U.S. national defense. It is one of the largest aircraft in the world, almost as long as a football field and as high as a six-story building. Four turbofan engines mounted on pylons under the wings power the C-5 aircraft. Each engine provides 41,000 pounds of thrust, enabling the aircraft to cruise at speeds greater than 541 miles per hour. The C-5 aircraft carries fully equipped, combat-ready military units to any point in the world on short notice and provides the field support required to help sustain the fighting force. They support U.S. Army, U.S. Navy, U.S. Marine Corps, and allied forces.

Unique features of the C-5 aircraft include the forward and aft cargo door and ramp systems. These full-size doors allow simultaneous on-loading and off-loading and drive-on/drive-off loading from either end of the aircraft. The C-5 Galaxy also features landing gear with "kneeling" capability that eases on-loading and off-loading operations by lowering the cargo compartment floor from 10 to 3 feet off the ground. The C-5 aircraft can carry up to 36 standard military 436-L pallets (each with an area of approximately 66 square feet [ft^2]) spread over the floor of the aircraft. The C-5 aircraft has carried special loads on past missions that would require extra time, manpower, and money if transported via land, ship, or rail. The upper deck is self-contained with a galley, two lavatories, and enough seating for 73 passengers. Another 267 airline seats can be installed on the cargo compartment floor, although troops are transported only in unusual circumstances.

Figures 2-1 and 2-2 show the general characteristics of the C-141C and C-5A/B aircraft, respectively.

Primary Function:	Cargo and troop transport
Engine:	4 Pratt & Whitney TF33-P-7 turbofan engines
Thrust:	20,250 pounds/engine
Wingspan:	160 feet
Length:	168 feet, 4 inches
Height:	39 feet, 3 inches
Maximum Takeoff Weight:	323,100 pounds peacetime; 343,000 pounds wartime
Crew:	5 (2 pilots, 2 flight engineers, and 1 loadmaster)
Cargo Compartment:	
Length:	93 feet, 4 inches
Width:	10 feet, 3 inches
Height:	9 feet, 1 inch

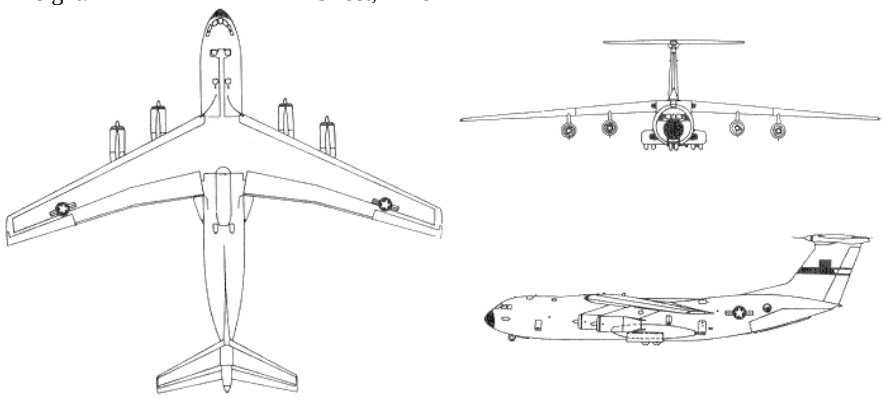

Figure 2-1. Characteristics of the C-141C Starlifter

Primary Function:	Cargo transport
Engine:	4 General Electric TF39-GE-1C turbofan engines
Thrust:	41,000 pounds/engine
Wingspan:	222 feet, 9 inches
Length:	247 feet, 10 inches
Height:	65 feet, 1 inch
Maximum Takeoff Weight:	769,000 pounds peacetime; 840,000 pounds wartime
Crew:	6 (2 pilots, 2 flight engineers, 2 loadmasters)
Cargo Compartment:	
Length:	143 feet, 9 inches
Width:	19 feet
Height:	13 feet, 6 inches

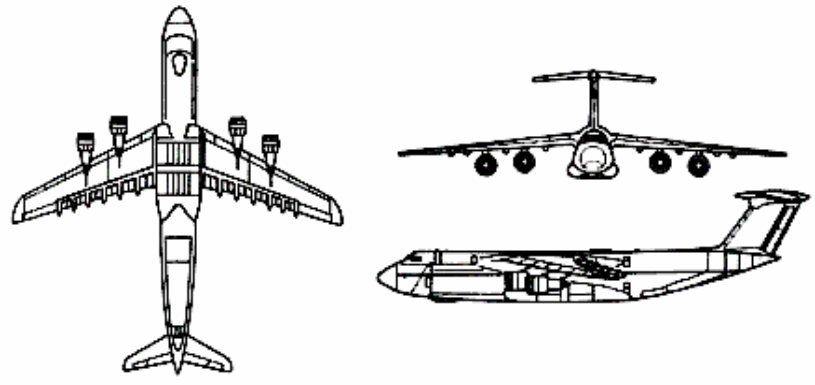

Figure 2-2. Characteristics of the C-5A/B Galaxy

2.2.2 Proposed Construction Program at Wright-Patterson AFB

The Proposed Action would involve the construction, modification, and removal of several facilities and buildings at Wright-Patterson AFB to support C-5 aircraft. The base planning staff examined various potential sites for each project. Project siting was chosen based on accepted criteria and best professional judgment to identify feasible, realistic scenarios for meeting mission objectives and facility requirements as follows:

- Consistency with the land use designation of the site
- Adequately sized area to support required operational functions
- Access to necessary base infrastructure
- Suitability of the site for construction and support of operations

AFRC has identified the need for ten construction projects to support the proposed beddown of C-5 aircraft at Wright-Patterson AFB. The construction projects would replace existing inadequate facilities and upgrade capabilities necessary to perform required activities. Table 2-2 presents the proposed construction projects. Figure 2-3 presents a map of Wright-Patterson AFB, and Figure 2-4 shows the location of proposed construction projects. Each project is discussed in greater detail below. All projects would involve required anti-terrorism/force protection measures and conform to applicable State of Ohio and Wright-Patterson AFB building codes and regulations.

Project 1: Alter C-5 Airfield Pavement (Phase I). Phase I of the C-5 Airfield Pavement Project would have a total footprint of 37,222 square yards (yd^2) (31,122 square meters [m^2]). The existing parking apron, which was recently structured for C-17 aircraft, would be widened by approximately 120 feet to provide parking for the larger C-5 airframe. Phase I would replace half of the existing paving from the parking apron to the hangars to accommodate C-5 aircraft loading. Expected timeline of construction would be from April 2005 to March 2006.

Project 2: Construct C-5 Scheduled Maintenance Hangar. The proposed C-5 scheduled maintenance hangar would accommodate maintenance staff and crib tools. Requirements for this facility include an Aircraft Generation Squadron locker and break room and maintenance command and scheduling office areas. The current C-141 hangar (Building 4028) would be demolished. The total building footprint would be 52,302 ft^2 (4,859 m^2), 22,300 ft^2 (2,070 m^2) larger than the existing hangar. Temporary facilities would be required during construction, which would be anticipated to occur starting in FY 06. Appropriate containment of spills, such as trench drains, would be included in the design of this facility.

Table 2-2. Proposed Construction Projects at Wright-Patterson AFB

	Project Name	Description	Fiscal Year	Area of New Construction (yd^2 or ft^2)
1	Alter C-5 Airfield Pavement (Phase I)	Widen current parking apron, replace half of the pavement from apron to hangar	05	37,222 yd^2
2	Construct C-5 Scheduled Maintenance Hangar	Construct C-5 hangar for scheduled maintenance Demolish Building 4028 (30,000 ft^2)	06	52,302 ft^2
3	Construct C-5 Multipurpose Hangar	Construct C-5 hangar for wash and spot paint capability Demolish Buildings 4022 (33,056 ft^2), and Buildings 4029, 4030, 4031, and 4033 (totaling approximately 3,122 ft^2)	05	70,342 ft^2
4	Alter C-5 Airfield Pavement (Phase II)	Widen current parking apron, replace half of the pavement from apron to hangar	06	37,222 yd^2
5	Alter Refueling Hydrants	Align existing refueling hydrants with C-5 parking plan	06	8 pits
6	Alter Maintenance Shops	Reconfigure Hangar 4026	06	10,000 ft^2
7	Construct C-5 Fuel Systems Maintenance Hangar	Construct C-5 area for fuel cell maintenance and maintenance staff	06	35,160 ft^2
8	Modify Flight Simulator Facility	Add to/alter C-141 simulator to support C-5 simulators	06	4,004 ft^2
9	Construct C-5 Squadron Operations Facility	Construct facility to support C-5 squadron operations and life support functions	06	30,600 ft^2
10	Alter Building 4014 for Reserve Training	Alter Building 4014 to support functions in Building 4042	07	45,390 ft^2

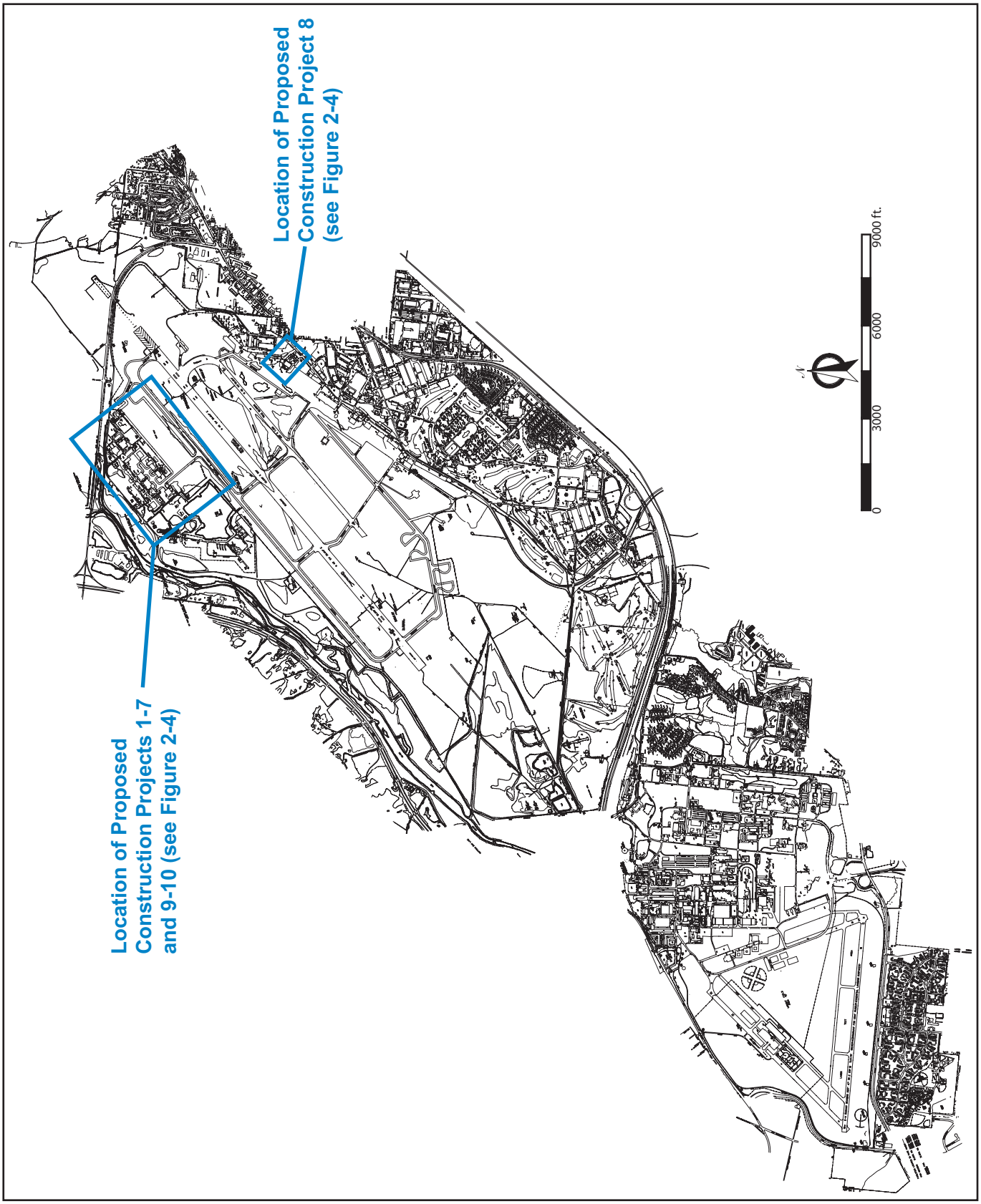

Figure 2-3. Wright-Patterson AFB Map

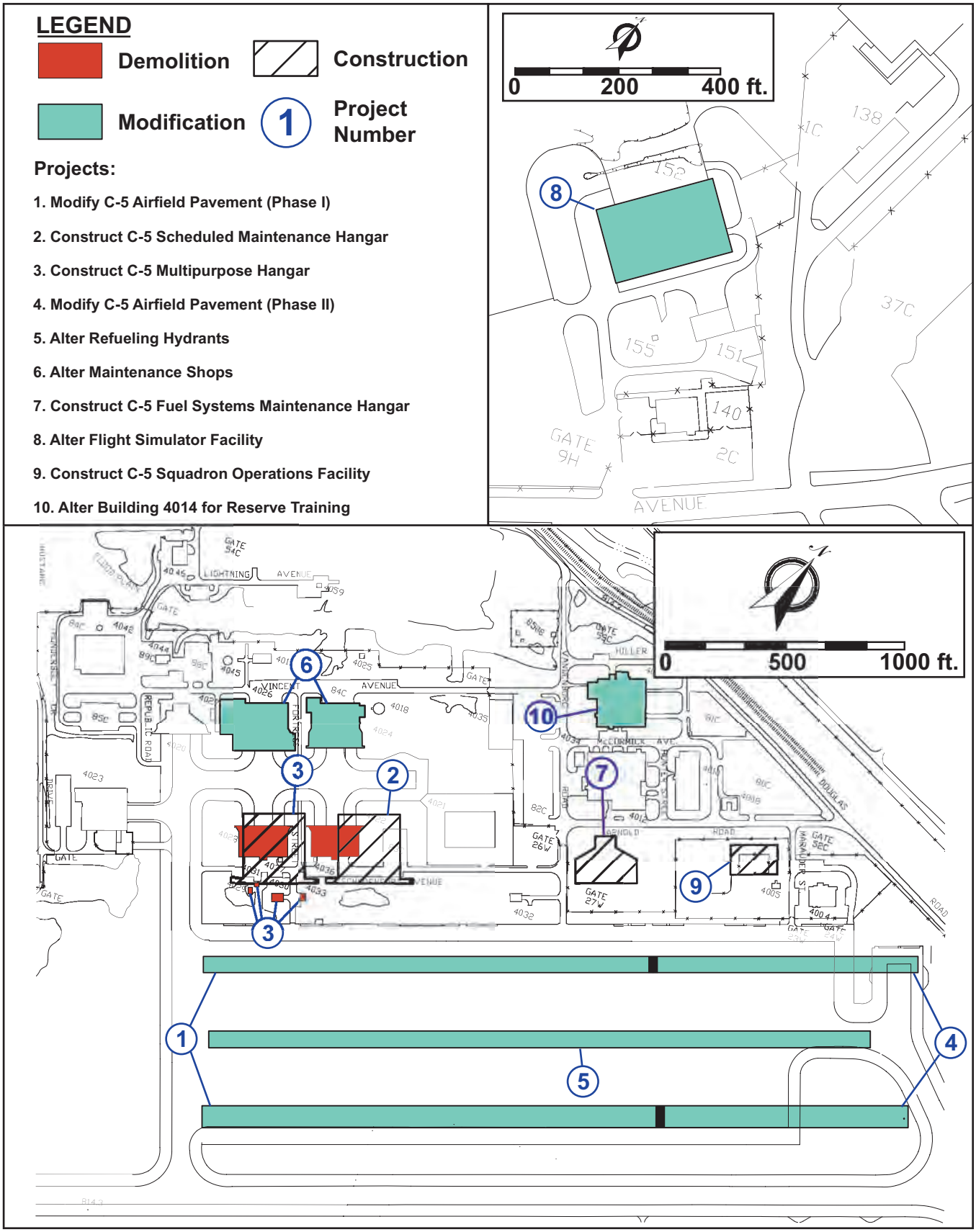

Figure 2-4. Proposed Construction Projects at Wright-Patterson AFB

Project 3: Construct C-5 Multipurpose Hangar. The proposed C-5 multipurpose hangar would accommodate full wash and spot paint capability. The hangar would be designed to permit aircraft jacking and include a C-5 fabrication shop to support aircraft maintenance operations. Demolition of Building 4022 would be required. The proposed building footprint would be 70,342 ft^2 (6,535 m^2), 37,286 ft^2 (3,460 m^2) larger than the existing hangar. Construction for this project would begin in 2005.

To accommodate the C-5 multipurpose hangar, Building 4031 would also be demolished, which is a very small facility that currently houses the oil/water separators for the 445 AW. New oil/water separators would be included as part of the design of the C-5 scheduled maintenance hangar when reconfiguring utilities. Appropriate containment for potential spills, such as trench drains, would also be included in the design of this facility. Buildings 4029, 4030, and 4033 would also be demolished during the construction of the C-5 multipurpose hangar. Demolition of all four of these buildings would be approximately 3,122 ft^2 (290 m^2).

Project 4: Alter C-5 Airfield Pavement (Phase II). Phase II of the C-5 Airfield Pavement Project would have a total footprint of 37,222 yd^2 (31,122 m^2). The existing parking apron, which was recently structured for C-17 aircraft, would be widened by approximately 120 feet to provide parking for the larger C-5 airframe. Phase II would replace the second half of the existing paving from the parking apron to the hangars to accommodate C-5 aircraft loading. Construction would begin immediately following completion of Phase I and would continue to March 2007.

Project 5: Alter Refueling Hydrants. The existing C-141 fuel hydrants would not accommodate new C-5 aircraft. Eight new pits would be installed; this would involve cutting pavement, running fuel/defuel lines to new pits, installing new pits, and replacing the displaced pavement. Moving the hydrants would be necessary to provide safe aircraft parking. The expected project timeline would be from April 2006 to March 2007.

Project 6: Alter Maintenance Shops. The current maintenance shops are configured to support C-141 aircraft and do not provide enough space to support C-5 functions. Under the Proposed Action, Hangar 4026 would be modified for the C-5 aircraft. Hangar 4026 would be reconfigured to accommodate the C-5 Electrical Environmental shop, Hydraulics shop, and Dash 21 rail systems for C-5 maintenance and storage. Dash 21 equipment storage and maintenance is currently in two facilities, one of which would be demolished under the Proposed Action. Electric Environmental shops require power services and compressed air, and some areas require special cooling. Shops include control room, refrigeration repair room, generator test stand, resistive load band room,

liquefied oxygen and nitrogen repair, actuator test stand room, and office space. The current Hydraulics Shop square footage would be inadequate for the C-5 and expansion would be needed. The expected project timeline would be from April 2006 to September 2007.

Project 7: Construct C-5 Fuel Systems Maintenance Hangar. A 35,160 ft^2 (3,266 m^2) hangar would be constructed to contain C-5 fuel cell maintenance and maintenance staff. The project would also include a fuel cell maintenance ventilation system that complies with environmental standards. Building 4020 is the current location for the fuel systems maintenance hangar, which would be released back to the Base for equipment storage following construction of the C-5 fuel systems maintenance hangar. The Fuel Systems Maintenance Hangar would be located along the flightline. The expected project timeline would be from April 2006 to September 2007.

Project 8: Modify Flight Simulator Facility. Building 152 would be modified to accommodate a C-5 flight simulator, which would require modification of 4,004 ft^2 (372 m^2) of facility space. Building 152 currently houses the flight simulator for C-141C aircraft. The C-5 flight simulator cannot be placed in the building unless the C-141 simulator is removed and modifications to the building are made. Load-bearing simulator points would be relocated in the enclosure floor to provide adequate support for the simulator equipment, and simulator enclosure walls, ceilings, hydraulic pathways, and power supply would need to be modified to have capacity for the C-5 simulator. Containment for potential spills or leaks from the hydraulic unit would be provided in the modifications. The expected project timeline would be from April 2006 to March 2007.

Project 9: Construct C-5 Squadron Operations Facility. A new Squadron Operations Facility would be necessary to support the conversion of C-141C aircraft to C-5 aircraft. A 30,600 ft^2 (2,845 m^2) C-5 Squadron Operations Facility would be constructed to increase efficiency. The expected project timeline would be from April 2006 to April 2007.

Project 10: Alter Building 4014 for Reserve Training. Modifications to Building 4014 would be necessary to eliminate an oversized facility and increase efficiency. The functions that are currently performed in Building 4042 would be relocated to Building 4014 upon completion of the modifications. The space would be needed to support Aeromedical Staging Squadron training, a Combat Logistics Support Squadron, a Civil Engineer Unit, and Security Forces training, which includes a simulated firing range. Modifying Building 4014 would reduce the Base's operations and training facilities by 60,000 ft^2 and would consolidate the Reserve training facilities. The expected project timeline would be from April 2007 to March 2008.

2.2.3 Changes in Personnel

Changes in personnel would occur as a result of the proposed aircraft conversion. There would be no change in number of Air Reserve Technician (ART) officer authorizations. Proposed program manpower authorizations would be an additional 137 ART enlisted personnel. Drill Officers would decrease by 13 authorizations, and Drill Enlisted would increase by 49 authorizations. There would be a net gain of 173 personnel.

2.2.4 Changes in Aircraft Operations

The C-5 is a heavy cargo transport aircraft designed to provide intertheater airlift support to U.S. national defense. Operations that would be performed by the C-5 aircraft would be similar to current operations performed by the C-141C aircraft. No low-level military airspace would be used by the 445 AW. Use of established airspace with a base altitude of 3,000 feet above ground level (AGL) does not require environmental analysis in accordance with the USAF EIAP, 32 CFR Part 989, as amended.

The types of aircraft operations discussed in this document are referred to as *airfield operations*. An airfield operation represents the single movement or individual portion of a flight in the Base airfield airspace environment, such as one departure, one arrival, or one transit of the airport traffic area. Thus, a single flight would generate at least two airfield operations (takeoff and landing).

The 445 AW currently conducts approximately 8,638 annual airfield operations at Wright-Patterson AFB. Airfield operations consist of landings and takeoffs, touch-and-go operations (TGOs), and closed-pattern flights. Since a pilot performing a TGO or a closed-pattern flight essentially performs a landing and a takeoff, TGOs and closed-pattern flights are each counted as two airfield operations. Table 2-3 shows current and proposed 445 AW total airfield operations at Wright-Patterson AFB. The percent change from C-141C operations in 2004 to C-5 aircraft operations in 2007 is a 53.7 reduction.

Table 2-3. Current and Proposed 445 AW Total Airfield Operations at Wright-Patterson AFB

Calendar Year	Current (C-141C Aircraft)	Proposed (C-5 Aircraft)
04	8,638	0
05	6,479	200
06	1,851	2,400
07	0	4,000

2.3 Detailed Description of the No Action Alternative

Under the No Action Alternative, the strategic airlift mission at Wright-Patterson AFB would continue until the remaining C-141C aircraft are retired or their useful life is extended. Replacement of these aircraft by C-5 aircraft would not occur. The C-141C aircraft would draw down as set by the current schedule. The C-141C operations at Wright-Patterson AFB would continue flying until FY 06. By that time, the C-141C might no longer be able to be supported with spare parts, and the C-141C fleet at Wright-Patterson AFB would be retired. All other missions operating at Wright-Patterson AFB would remain. AFRC aircraft at other bases would require increased flying time to make up for the lost capability once supported by the C-141C aircraft at Wright-Patterson AFB.

2.4 Alternatives Eliminated from Further Consideration

As part of the NEPA process, potential alternatives to the Proposed Action must be evaluated. Two alternatives to the Proposed Action were considered to determine their feasibility as a viable alternative to the beddown of C-5 aircraft at Wright-Patterson AFB. These alternatives are as follows:

- Conversion to C-17 aircraft
- Conversion to C-130E aircraft

A preliminary and subjective analysis was conducted to aid in determining the feasibility of the alternatives. A detailed discussion of the feasibility of converting the existing C-141C aircraft to the C-17 and the C-130E is presented in Sections 2.4.1 and 2.4.2, respectively.

2.4.1 Conversion to the C-17 Aircraft

The C-17 Globemaster III is a heavy-lift, air-refuelable, cargo and troop transport aircraft. Designed to support both inter- and intratheater operations, the aircraft affords direct delivery airlift of all classes of military cargo, including outsized items such as armored vehicles. It is the first aircraft capable of air-landing or air-dropping outsized cargo in the tactical environment. Four Pratt & Whitney F117-PW-100 turbofan engines power the aircraft. Each engine develops 40,440 pounds of thrust, enabling the aircraft to operate from small, austere airfields (3,000 feet by 90 feet) and cruise at greater than 500 miles per hour. Design features of the aircraft provide reduced takeoff and landing distances, improved lift, and reduced risk of stall. Thrust reversers on the engines afford enhanced ground maneuverability. The aircraft is capable of backing up a 2 percent grade with 160,000 pounds of cargo, and has enough fuel to fly 2,500 nautical miles. On the ground, the C-17

can make a 180-degree U-turn in 114 feet, and a 180-degree Star Turn (with backing) in 80 feet. With a 130,000-pound payload, the C-17 has an unrefueled range of 3,200 miles. The aircraft's maximum payload is 170,900 pounds. The availability of C-17 airframes depends primarily on the Department of Defense (DOD) purchasing schedule. Wright-Patterson AFB could not receive C-17 aircraft before the scheduled retirement of the C-141C aircraft, which would leave the 445 AW without an active mission. Therefore, to maintain the airlift mission of the 445 AW, conversion to C-17 aircraft is not a viable alternative at this time and will not be carried forward for analysis.

2.4.2 Conversion to C-130E Aircraft

The C-130 Hercules is one of the USAF's most versatile tactical airlift aircraft. More than 2,000 C-130 aircraft have been built since the aircraft first flew in 1954. The C-130E is an extended-range development of the C-130B with large underwing fuel tanks. Three hundred sixty-nine C-130E aircraft were delivered to the USAF in April 1962, and, eventually, 389 more were delivered. Modifications to the avionics aboard the C-130E have extended its life well into the 21st century. It can perform a large range of missions, but is primarily used for the tactical portion of the airlift mission. The aircraft is approximately 98 feet long, 38 feet high, and has a wingspan of nearly 133 feet. Depending on the mission, it is capable of being configured to carry approximately 45,000 pounds of cargo, 92 troops, 64 paratroops, or 74 stretchers. The crew of a C-130E is made up of two pilots, one navigator, one flight engineer, and one loadmaster. There are no C-130E aircraft available in the USAF inventory that could be relocated to Wright-Patterson AFB. Therefore, the conversion to C-130E aircraft at Wright-Patterson AFB will not be carried forward for further analysis.

2.5 Other Actions Announced at Wright-Patterson AFB

As part of the NEPA process, cumulative effects of a proposed action combined with other past, present, and reasonably foreseeable future projects must be considered. The following are other projects that might be occurring at Wright-Patterson AFB:

- Construction of a Type III Pressurized Hydrant Fueling System
- Construction of an engine run/deicing pad
- Implementation of the Capital Investments Program (WPAFB 2003)
- Enclosure of Open Ditch No. 5
- Expansion and Renovation of Dog Kennels

Although not an element of this EA's Proposed Action, these actions are addressed in Section 5 as potential cumulative impacts.

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3. Affected Environment

This section describes the environmental and socioeconomic conditions most likely to be affected by the Proposed Action. It provides information to serve as a baseline from which to identify and evaluate environmental and socioeconomic changes likely to result from implementation of the Proposed Action. Baseline conditions represent current conditions.

In compliance with NEPA, CEQ guidelines, and 32 CFR 989, the description of the affected environment focuses on those resources and conditions potentially subject to impacts. These resources and conditions include airspace management, noise, land use, air quality, safety, geological resources, water resources, biological resources, cultural resources, socioeconomics and environmental justice, infrastructure, and hazardous materials and wastes.

Resource Areas. The term "resource areas" refers to those aspects of the human environment that might be affected by a proposed action. Resource areas are organized into broad groupings of environmental assets, such as water resources or biological resources. Some aspects of the environment reflect conditions imposed by humans. These include land use and hazardous waste sites.

Principal Resource Areas. Analysis of potential environmental effects focuses on those resource areas that are appropriate for consideration in light of a proposed action. All resource areas are initially considered, but some may be eliminated from detailed examination because of their inapplicability to a particular proposal. When detailed analysis within a principal resource area is eliminated, the "Definition of the Resource" will describe the portion of the proposal from which the analysis is excluded and the rationale for its exclusion. The following discussions identify major aspects of the resource areas and conditions and indicate environmental aspects typically grouped under the major headings.

3.1 Airspace Management

3.1.1 Definition of the Resource

The USAF describes airspace management as the coordination, integration, and regulation of the use of airspace of defined dimensions. The objective of airspace management is to meet military training requirements through the safe and efficient use of available navigable airspace. This is to be

accomplished in a peacetime environment, while minimizing the impact on other aviation users and the public (AFI 13-201).

There are two categories of airspace, or airspace areas: regulatory and nonregulatory. Within these two categories, further classifications include controlled, uncontrolled, special use, and airspace for special use. The categories and types of airspace are dictated by

- The complexity or density of aircraft movement
- The nature of the operations conducted within the airspace
- The level of safety required
- National and public interest in the airspace

Controlled Airspace. Controlled airspace is a generic term that encompasses the different classifications (Classes A, B, C, D, and E) of airspace and defines dimensions within which air traffic control (ATC) service is provided to flights under instrument meteorological conditions, and to flights under visual meteorological conditions. All military and civilian aircraft are subject to Federal Aviation Regulations. Figure 3-1 depicts the FAA Airspace Classifications discussed below.

Class A airspace includes all operating altitudes of 18,000 feet above mean sea level (MSL) and above. Class A airspace is most frequently used by commercial aircraft between altitudes of 18,000 and 45,000 feet above MSL.

Class B airspace typically comprises contiguous cylinders of airspace, stacked one upon another and extending from the surface up to 10,000 feet AGL. To operate in Class B airspace, pilots must contact appropriate controlling agencies and receive clearance to enter the airspace. Additionally, aircraft operating within Class B airspace must be equipped with specialized electronics that allow air traffic controllers to track aircraft speed, altitude, and position accurately. Class B airspace is typically associated with major airport complexes, such as the Cincinnati Northern Kentucky International Airport, Kentucky, and JFK International Airport, New York.

Class C airspace can generally be described as controlled airspace that extends from the surface or a given altitude to a specified higher altitude. Class C airspace is designed and implemented to provide additional ATC into and out of primary airports where aircraft operations are periodically

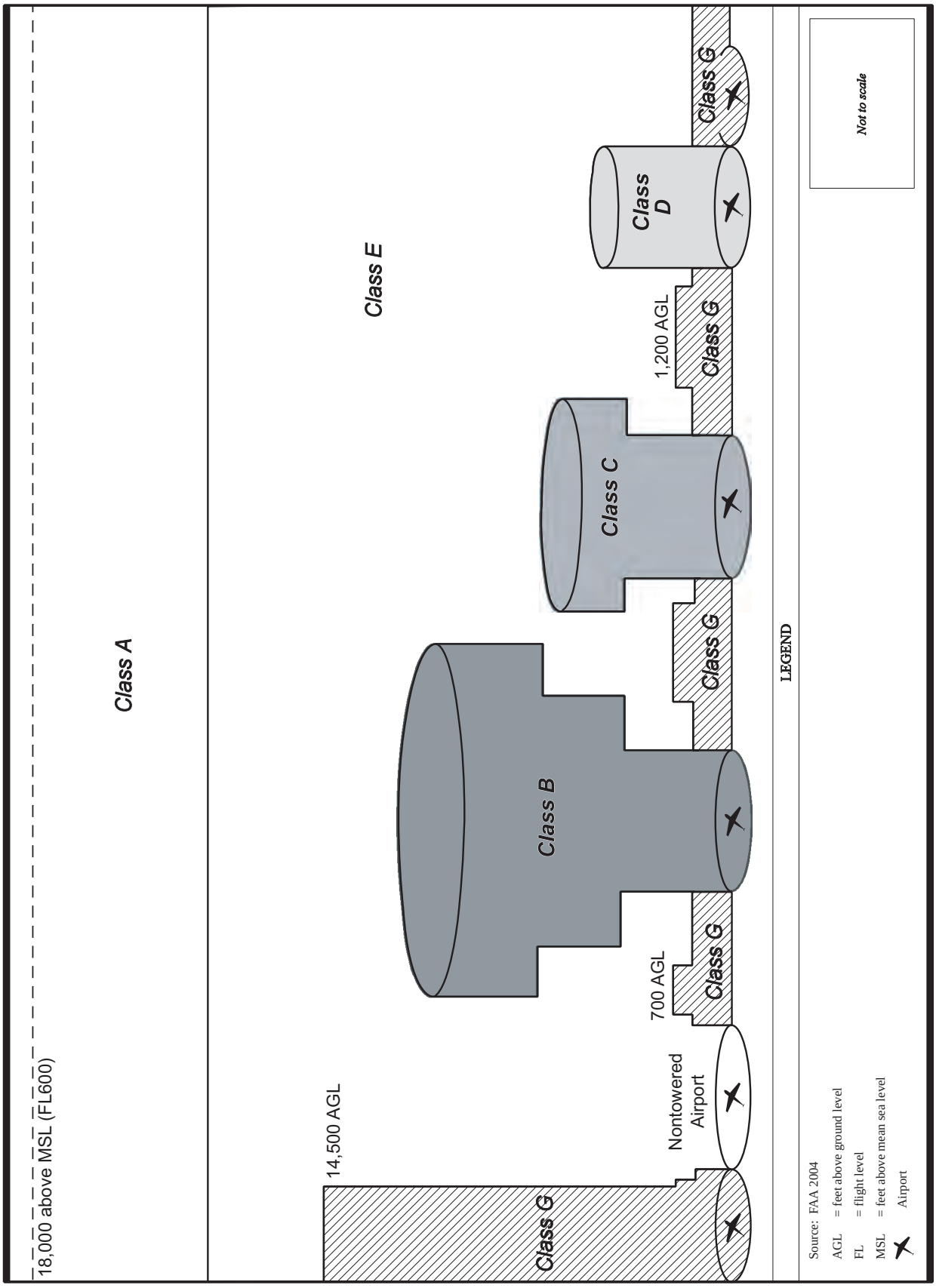


Figure 3-1. FAA Airspace Classifications

at high density levels, such as James M. Cox Dayton International Airport, Ohio. All aircraft operating within Class C airspace are required to maintain two-way radio communication with local ATC facilities.

Class D airspace encompasses a 5-statute-mile radius of an operating air traffic-controlled airport. It extends from the ground to 2,500 feet AGL or higher. All aircraft operating within Class D airspace must be in two-way radio communication with the ATC facility. The airspace surrounding Wright-Patterson AFB is designated as Class D airspace.

Class E airspace can be described as general controlled airspace. It includes designated Federal airways consisting of the low altitude (V or "Victor" Route) system. Federal airways have a width of 4 statute miles on either side of the airway centerline and can be structured between the altitudes of 700 feet AGL and 18,000 feet above MSL. These airways frequently intersect approach and departure paths from both military and civilian airfields. Class E airspace may range from ground level at non-towered airfields up to 18,000 feet above MSL. The majority of Class E airspace is where more stringent airspace control has not been established.

Uncontrolled Airspace. Uncontrolled airspace (Class G) is not subject to restrictions that apply to controlled airspace. Limits of uncontrolled airspace typically extend from the surface to 700 feet AGL in urban areas, and from the surface to 1,200 feet AGL in rural areas. Uncontrolled airspace can extend above these altitudes to as high as 14,500 feet above MSL if no other types of controlled airspace have been assigned. ATC does not have authority to exercise control over aircraft operations within uncontrolled airspace. Primary users of uncontrolled airspace are general aviation aircraft operating under visual meteorological conditions.

Special Use Airspace. Special Use Airspace consists of airspace within which specific activities must be confined, or wherein limitations are imposed on aircraft not participating in those activities. With the exception of Controlled Firing Areas, special use airspace is depicted on aeronautical charts. Chart depictions include hours of operation, altitudes, and the agency controlling the airspace. All special use airspace descriptions are contained in FAA Order 7400.8, Special Use Airspace. Examples of special use airspace in the local flying area of Wright-Patterson AFB are restricted areas (e.g., R-3701), military operations areas (e.g., Buckeye MOA), prohibited areas (e.g., P-56), and warning areas (e.g., W-107).

Airspace for Special Use. Airspace for Special Use are areas used by military aircraft but do not put restrictions on nonparticipating aircraft. They are designated as such for informational purposes for

general aviation. Examples of airspace for special use are military training routes (MTRs), slow routes, and aerial refueling (AR) tracks. The 445 AW does not currently fly or propose to fly on MTRs or slow routes.

MTRs are flight paths that provide a corridor for low-altitude navigation and training. Low-altitude navigation training is important because aircrews might be required to fly at low altitudes for tens or hundreds of miles to avoid detection in combat conditions. To train realistically and safely, the military and the FAA have developed MTRs. This allows the military to train for low-altitude navigation at airspeeds in excess of 250 knots indicated airspeed (KIAS) (approximately 285 miles per hour [mph]). There are two types of MTRs: instrument routes and visual routes. Typical MTRs are from 4 to 10 nautical miles wide and have altitude structures from 100 feet AGL to 5,000 feet above MSL or higher. The centerlines of MTRs are depicted on aeronautical charts.

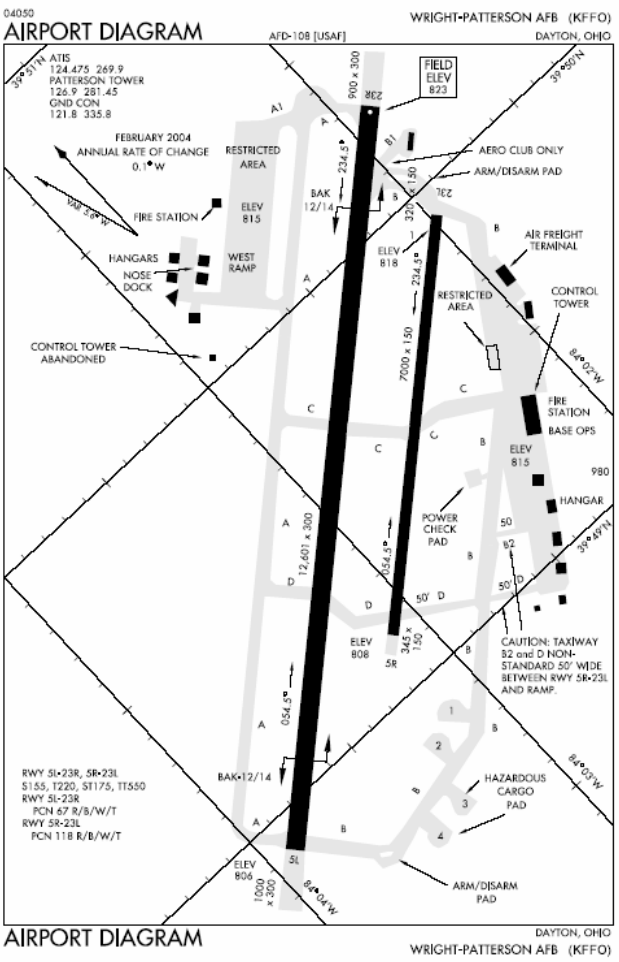
Slow routes are similar to MTRs in structure but are used by aircraft that normally operate at low-level airspeeds of less than 250 KIAS. Slow routes are designated through military approval channels and do not require FAA coordination. The maximum altitude that can be flown in slow routes is 1,500 AGL.

The typical air refueling mission would use AR tracks already established in the DOD *Flight Information Publication AP/1B, Area Planning, Military Training Routes* (called "the FLIP") with generic routing to and from the tracks. These AR tracks are located throughout the country. Use of established airspace with a base altitude of 3,000 feet AGL does not require environmental analysis in accordance with the USAF *EIAP*, 32 CFR 989, as amended. The 445 AW does not currently fly or propose to fly on MTRs or slow routes and would not require use of low-level (less than 3,000 feet AGL) airspace.

3.1.2 Existing Conditions

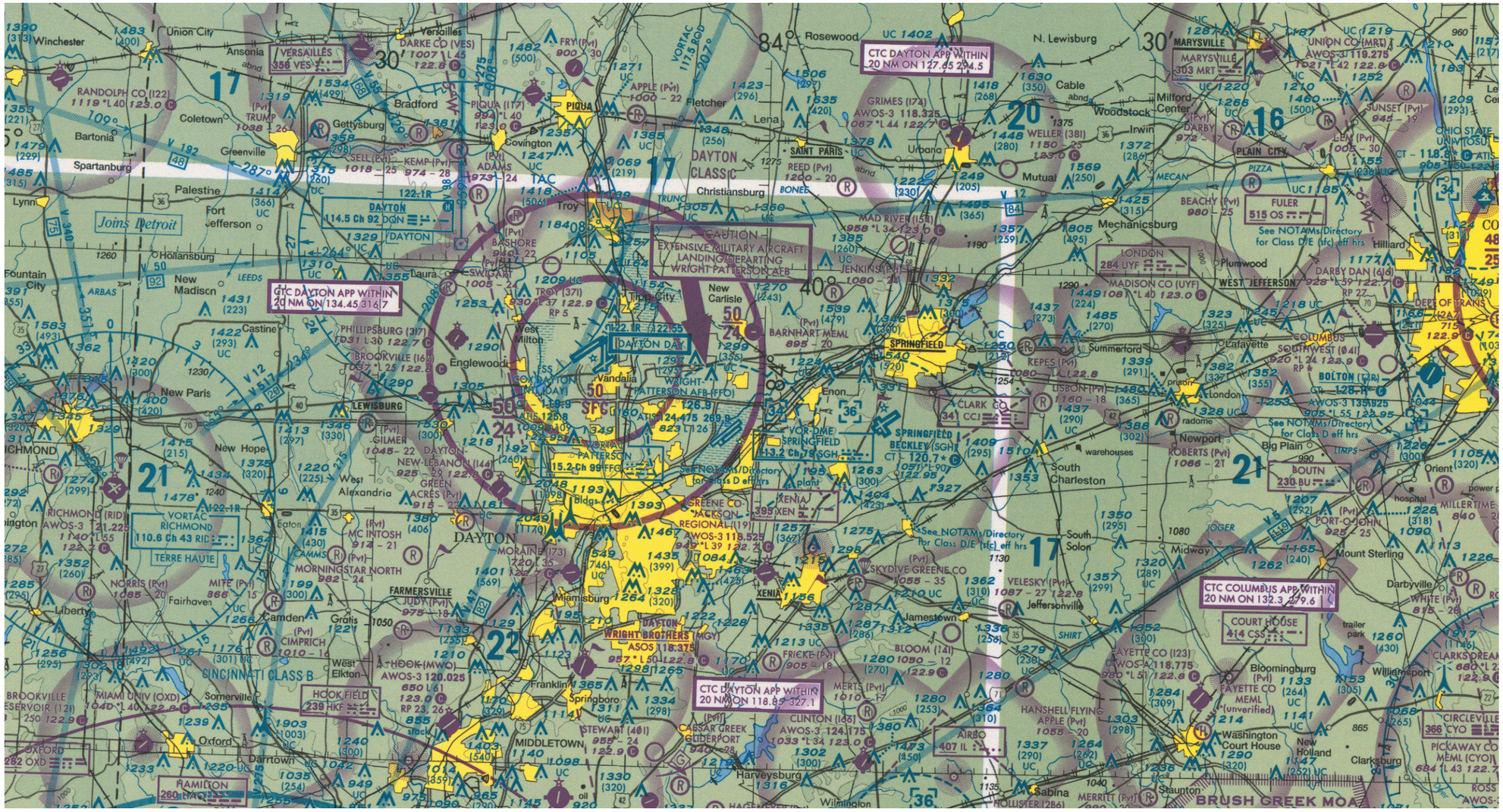
Wright-Patterson AFB. Wright-Patterson AFB is managed and maintained by the 88 ABW. The Base is in many measures the largest, most diverse, and organizationally complex installation in the USAF. Missions range from acquisition and logistics management to research and development, education, flight operations, and many other defense-related activities. Wright-Patterson AFB currently provides support for approximately 257 daily aircraft operations and is one of the USAF's largest bases. The 445 AW currently flies and maintains 16 C-141C aircraft in the mission of worldwide mobility (refer to Table 2-3).

An aircraft operation represents the single movement or individual portion of a flight in the base airfield airspace environment, such as one departure, one arrival, or one transient of the airport traffic area. Since a pilot performing a TGO or a closed-pattern flight essentially performs a landing and a takeoff, TGOs and closed-pattern flights are each counted as two operations. Thus, a single flight would generate at least two airfield operations (takeoff and landing). Wright-Patterson AFB has two runways oriented north-south; Runway 05L/23R is 12,601 feet long and Runway 05R/23L is 7,000 feet. Figure 3-2 provides an airfield diagram of Wright-Patterson AFB. The airfield is surrounded by Class D airspace and lies under the Class C airspace of James M. Cox Dayton International Airport. Figure 3-3 depicts the local controlled airspace in the vicinity of Wright-Patterson AFB.



Source: NIMA 2003

Figure 3-2. Wright-Patterson AFB Airfield Diagram



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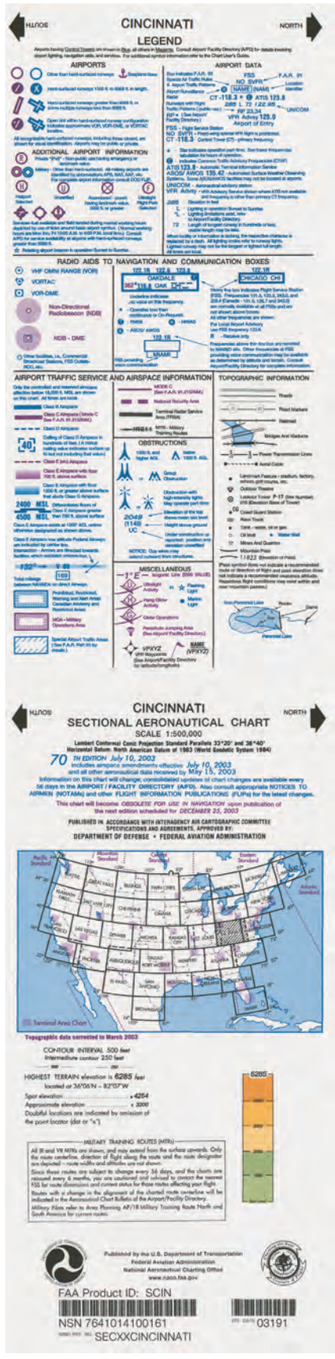

Figure 3-3. Local Controlled Airspace Surrounding Wright-Patterson AFB

Transitional Airfields. The 445 AW conducts the majority of its aircraft operations at Wright-Patterson AFB. However, when precluded by weather, the 445 AW uses various transitional airfields, which include Selfridge Air National Guard Base, Michigan; Rickenbacker International Airport, Ohio; and Campbell Army Airfield, Kentucky. These airfields are currently used to conduct instrument and visual flight rules pattern practice (landing and takeoff practice) when the local weather at Wright-Patterson AFB is unsuitable for training requirements and/or construction precludes safe flying operations (e.g., a tall crane being used close to the runway or rubber removal from the runway). The 445 AW currently maintains Letters of Agreement with each of these airfields, which establish procedures and requirements on both the 445 AW and each airfield. These Letters of Agreement also provide an excellent tool for Operational Risk Management.

3.2 Noise

3.2.1 Definition of the Resource

Physically, there is no distinction between sound and noise. Sound is a sensory perception and the complex pattern of sound waves is labeled noise, music, speech, and so forth. Thus, noise is defined as any sound that is undesirable because it interferes with communication, is intense enough to damage hearing, or is otherwise annoying. Human response to noise varies according to the source type, characteristics of the noise source, distance between source and receptor, receptor sensitivity, and time of day.

Sound is measured with instruments that record instantaneous sound levels in decibels (dB). A-weighted sound level measurements (dBA) are used to characterize sound levels that can be sensed by the human ear. "A-weighted" denotes the adjustment of the frequency content of a noise event to represent the way in which the average human ear responds to the noise event. All sound levels analyzed in this EA are A-weighted.

In this EA, single-event noise, such as an overflight, is described by the sound exposure level (SEL). Noise levels, resulting from multiple single-events, are used to characterize community noise effects from aircraft or airfield environment, and are measured in day-night average A-weighted sound level (DNL). A general discussion of these metrics is provided below and a more thorough explanation is provided in Appendix B.

Sound Exposure Level. The SEL measurement describes a noise event, such as an aircraft overflight, comprising a period of time when an aircraft is approaching a receptor and noise levels are increasing, the instant when the aircraft is closest to the receptor and the maximum noise level is experienced,

and the period of time when the aircraft moves away from the receptor resulting in decreased noise levels. SEL is a measure that accounts for both loudness and duration of a noise event.

The SEL metric incorporates a single event, which is useful when calculating aircraft flyovers. Frequency, magnitude, and duration vary according to aircraft type, engine type, and power setting. Therefore, individual aircraft noise data are collected for various types of aircraft and engines at different power settings at various phases of flight. These values form the basis for the individual-event noise descriptors at any location, and are adjusted to the location by applying appropriate corrections for temperature, humidity, altitude, and variations from standard aircraft operating profiles and power settings. Table 3-1 provides SEL values at various altitudes for aircraft operating directly over head at various speeds and power settings depending on aircraft type (values in the table represent averages).

Table 3-1. SEL dB Values for Aircraft Operating in the Vicinity of Wright-Patterson AFB

Altitude (feet AGL)	C-5 [1]	C-17 [1]	C-21A [1]	KC-135R [1]	C-141C [1]	F-16A [1]
200	118.2	109.8	95.4	102.2	115.4	08.1
500	111.2	102.1	88.9	95.8	108.3	101.9
1,000	105.3	95.1	83.4	90.6	102.1	96.8
2,000	98.2	87.1	77.3	84.9	94.9	91.1
3,150	92.7	81.8	72.7	80.7	89.8	86.8
5,000	85.8	76.5	67.7	76.1	84.8	82.0

[1] Based on steady, level flight and using Omega 108 aircraft profile data from actual overflight noise measurements. Omega 108 is a standalone DOD noise-modeling program that allows the user to retrieve data from the NOISEMAP database.

Day-Night Average A-weighted Sound Level. The DNL noise metric incorporates a "penalty" for evening and nighttime noise events to account for increased annoyance. DNL is the energy-averaged sound level measured over a 24-hour period, with a 10 dB penalty assigned to noise events occurring between 10:00 p.m. and 7:00 a.m. DNL values are obtained by averaging SEL values for a given 24-hour period. DNL is the preferred noise metric of HUD, FAA, USEPA, and DOD for modeling airport environs.

Most people are exposed to sound levels of DNL 50 to 55 dBA or higher on a daily basis. Studies specifically conducted to determine noise impacts on various human activities show that about 90 percent of the population is not significantly bothered by outdoor sound levels below DNL of 65 dBA (USDOT 1980).

Studies of community annoyance in response to numerous types of environmental noise show that DNL correlates well with impact assessments and that there is a consistent relationship between DNL and the level of annoyance. The "Schultz Curve" (discussed in Appendix B) shows the relationship between DNL noise levels and the percentage of the population predicted to be highly annoyed.

Noise Criteria and Regulations. Federal and local governments have established noise guidelines and regulations for the purpose of protecting citizens from potential hearing damage and from various other adverse physiological, psychological, and social effects associated with noise. The following paragraphs describe the guidelines and regulations that are relevant to the project.

According to USAF, FAA, and HUD criteria, residential units and other noise-sensitive land uses are "clearly unacceptable" in areas where the noise exposure exceeds DNL of 75 dBA, "normally unacceptable" in regions exposed to noise between the DNL of 65 to 75 dBA, and "normally acceptable" in areas exposed to noise where the DNL is 65 dBA or less. FICON developed land-use compatibility guidelines for noise in terms of DNL (USDOT 1980). DNL is the metric used by the USAF in determining noise impacts of military airfield operations for land use planning. USAF land use compatibility guidelines (relative to DNL values) are documented in the AICUZ Program Handbook (USAF 1999). Four noise zones are used in AICUZ studies to identify noise impacts from aircraft operations. These noise zones range from DNL of 65 to 80 dBA and above. For example, it is recommended that no residential uses, such as homes, multifamily dwellings, dormitories, hotels, and mobile home parks, be located where the noise is expected to exceed a DNL of 65 dBA. If sensitive structures are located in areas within a DNL of 65 to 75 dBA, noise-sensitive structures should be designed to achieve a DNL of 25 to 30 dBA interior noise reduction. Noise-sensitive structures might include schools, concert halls, hospitals, and nursing homes. Elevated noise levels in these structures can interfere with speech, causing annoyance or communication difficulties. Some commercial and industrial uses are considered acceptable where the noise level exceeds DNL of 65 dBA. For outdoor activities, USEPA recommends DNL of 55 dBA as the sound level below which there is no reason to suspect that the general population will be at risk from any of the effects of noise (USEPA 1974).

Response to Noise Events. Noise can cause a person to be irritated or annoyed. Noise annoyance is defined by USEPA as any negative subjective reaction to noise by an individual or group. DNL is an accepted unit for quantifying annoyance to humans by general environmental noise, including aircraft noise. Table 3-2 describes the percentage of people who were "highly annoyed" when exposed to various levels of noise measured in DNL. This table presents the results of over a dozen studies of

the relationship between noise and annoyance levels. This relationship was suggested in 1977 by the National Academy of Science and was recently reevaluated for use in describing people's reaction to semi-continuous (transportation) noise. The data shown provides a perspective on the level of annoyance that might be anticipated. For example, 15 to 25 percent of persons exposed on a long-term basis to DNL of 65 to 69 dBA are expected to be highly annoyed by noise events.

Table 3-2. Percentage of Population Highly Annoyed by Noise Zones

DNL	Percentage of Persons Highly Annoyed	
	Low	High
65–69 dBA	15	25
70–74 dBA	25	37
75–79 dBA	37	52
80 + dBA	61	61

Source: USAF 2000
Notes:
dBA = A-weighted decibel
DNL = Day-Night Average A-Weighted Sound Level

The effects of noise on sleep are of concern, primarily in ensuring suitable residential environments. DNL incorporates consideration of sleep disturbance by assigning a 10 dBA penalty to nighttime noise events (10:00 p.m. to 7:00 a.m.). More typically, single noise events, not average sound levels, correlate with sleep disturbance. A discussion of the relationships between the occurrence of awakening and SEL is presented in Appendix B. Most of these relationships do not reflect habituation and, as such, do not address long-term sleep disturbance effects. Nevertheless, the studies can be used to demonstrate relative differences in interference among different noise-event exposure scenarios.

3.2.2 Existing Conditions

Construction Program. Building construction, modification, and demolition work can cause considerable noise emissions. A variety of sounds come from cranes, cement mixers, welding, hammering, boring, and other work processes. Construction equipment and building operations are often poorly silenced, but quickly become a part of the ambient noise levels heard every day.

The ten proposed construction, modification, and removal projects detailed in Section 2.2.2 would generate the types of sounds listed in the above paragraph. These activities would occur intermittently between FY 05 and FY 08.

Aircraft Operations. Existing noise contours were analyzed using results from DOD-approved noise models in the vicinity of Wright-Patterson AFB. NOISEMAP has a specific database for military helicopters and fixed-wing type aircraft, including C-141 and C-5 aircraft (USAF 1990).

The most recent noise contour analysis is presented in the 1995 AICUZ Study for Wright-Patterson AFB, Ohio. The current mission noise contours presented in the 1995 AICUZ Study will be used as the baseline for the noise analysis in this EA (WPAFB 1995a). Figure 3-4 depicts the current mission noise contours presented in the 1995 AICUZ Study. No noise-sensitive receptor sites were identified in the 1995 AICUZ Study.

3.3 Land Use

3.3.1 Definition of the Resource

The term land use refers to real property classifications that indicate either natural conditions or the types of human activity occurring on a parcel. In many cases, land use descriptions are codified in local zoning laws. There is, however, no nationally recognized convention or uniform terminology for describing land use categories. As a result, the meanings of various land use descriptions, labels, and definitions vary among jurisdictions.

Natural conditions of property can be described or categorized as unimproved, undeveloped, conservation or preservation area, and natural or scenic area. There is a wide variety of land use categories resulting from human activity. Descriptive terms often used include residential, commercial, industrial, agricultural, institutional, and recreational.

Two main objectives of land use planning are to ensure both orderly growth and compatible uses among adjacent property parcels or areas. Compatibility among land uses fosters the societal interest of obtaining the highest and best uses of real property. Tools supporting land use planning include written master plans/management plans and zoning regulations. In appropriate cases, the locations and extent of proposed actions need to be evaluated for their potential effects on project sites and adjacent land uses. The foremost factor affecting a proposed action in terms of land use is its compliance with any applicable land use or zoning regulations. Other relevant factors include existing land use at the project site, the types of land uses on adjacent properties and their proximity to a proposed action, the duration of a proposed activity, and its "permanence."

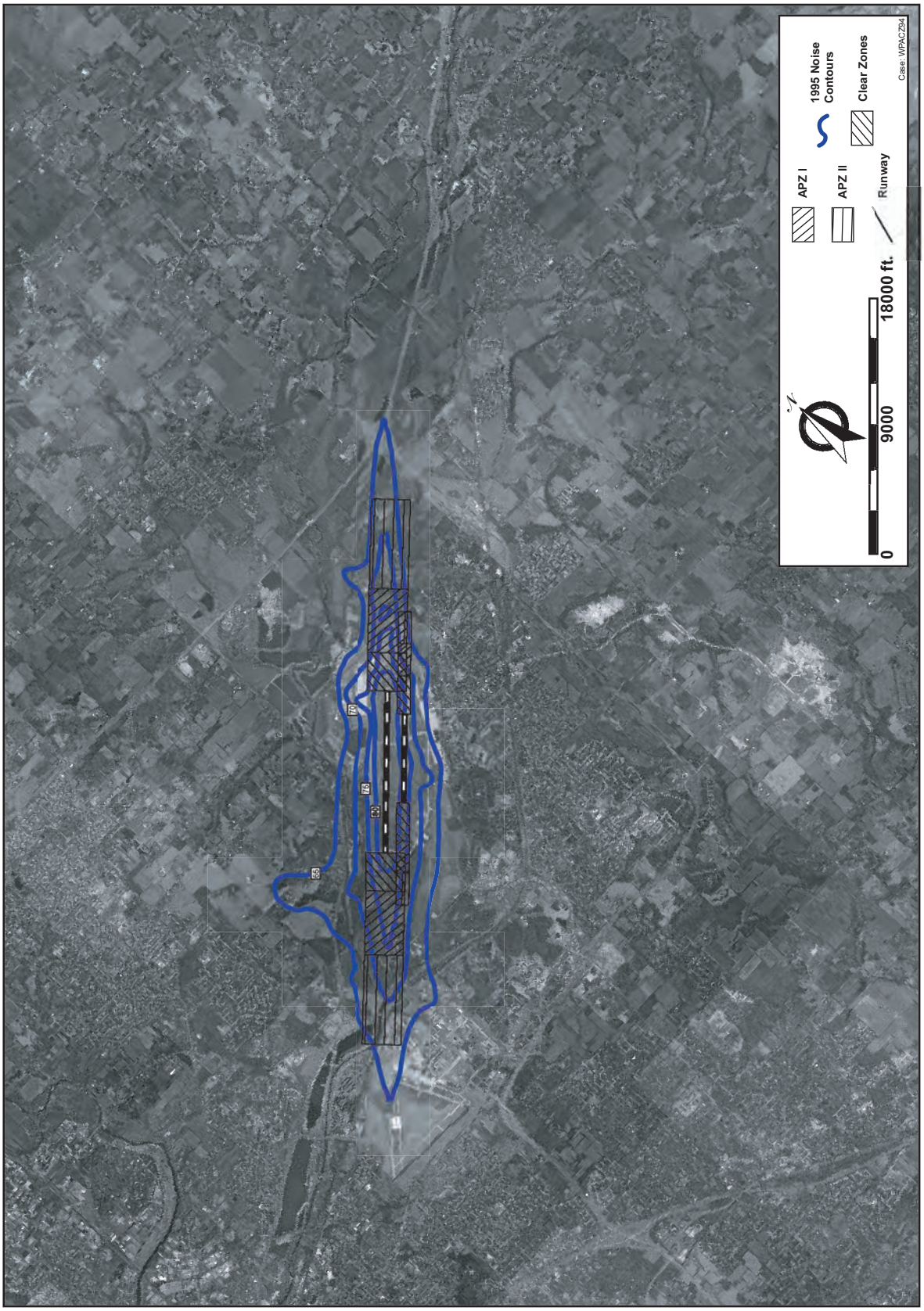

Figure 3-4. 1995 Wright-Patterson AFB Noise Contours

In the context of aircraft operations, land use compatibility is also described in the context of noise levels. As described in Section 3.2.1, a DNL of 65 dBA is useful to recognize as a level that, when exceeded, is normally not compatible with residential land use. DOD analysis has determined that the areas immediately beyond the ends of the runways and along the approach and departure flight paths have the highest potential for accidents. Based on this analysis, DOD developed three zones that have a relative potential for accidents. The clear zones (CZs), areas closest to the runway ends, are the most hazardous. The overall risk is such that DOD generally acquires the land through purchase or easement to prevent development. Accident potential zones (APZs) are outside of the CZs. APZ I is immediately beyond the CZ and has a high potential for accidents. APZ II is immediately beyond APZ I and has measurable potential for accidents. While aircraft accident potential in APZs I and II do not necessarily warrant acquisition by USAF, land use planning and controls are strongly encouraged for the protection of the public. Compatible land uses are specified for these zones.

3.3.2 Existing Conditions

On-Base Land Use. Wright-Patterson AFB comprises 8,145 acres near Dayton, Ohio. The Base is expected to fulfill numerous roles within the USAF, incorporating both natural and man-made development constraints within the Base boundaries. Over 2,500 acres of Wright-Patterson AFB remain undeveloped due to various development constraints.

There is a wide variety of land use classifications on Wright-Patterson AFB (see Figure 3-5). Open Space and Outdoor Recreation represent some of the land constrained from development. Over 2,000 acres of this undeveloped land lies within the natural constraints area, which is composed of areas such as floodplains, lakes, wetlands, or areas with unsuitable soil for building. Also located within the natural constraint area is the Huffman Prairie Flying Field containing remnant prairie habitat, which includes several rare plant and animal species within the 109 acres.

Human-made constraints also restrict development within the Wright-Patterson AFB boundaries. Included in these types of constraints are archaeological sites and historic buildings, which can be identified sites or those that remain undiscovered. Operational restrictions can also impede development. Noise contours from aircraft operations and explosive safety zones must be considered when looking at developing areas on the Base. Airfield and airspace control surfaces, such as runway approach CZs, are to remain clear of building obstructions. The presence of past waste disposal sites and fire training areas must be considered when siting facilities (WPAFB 1995a).

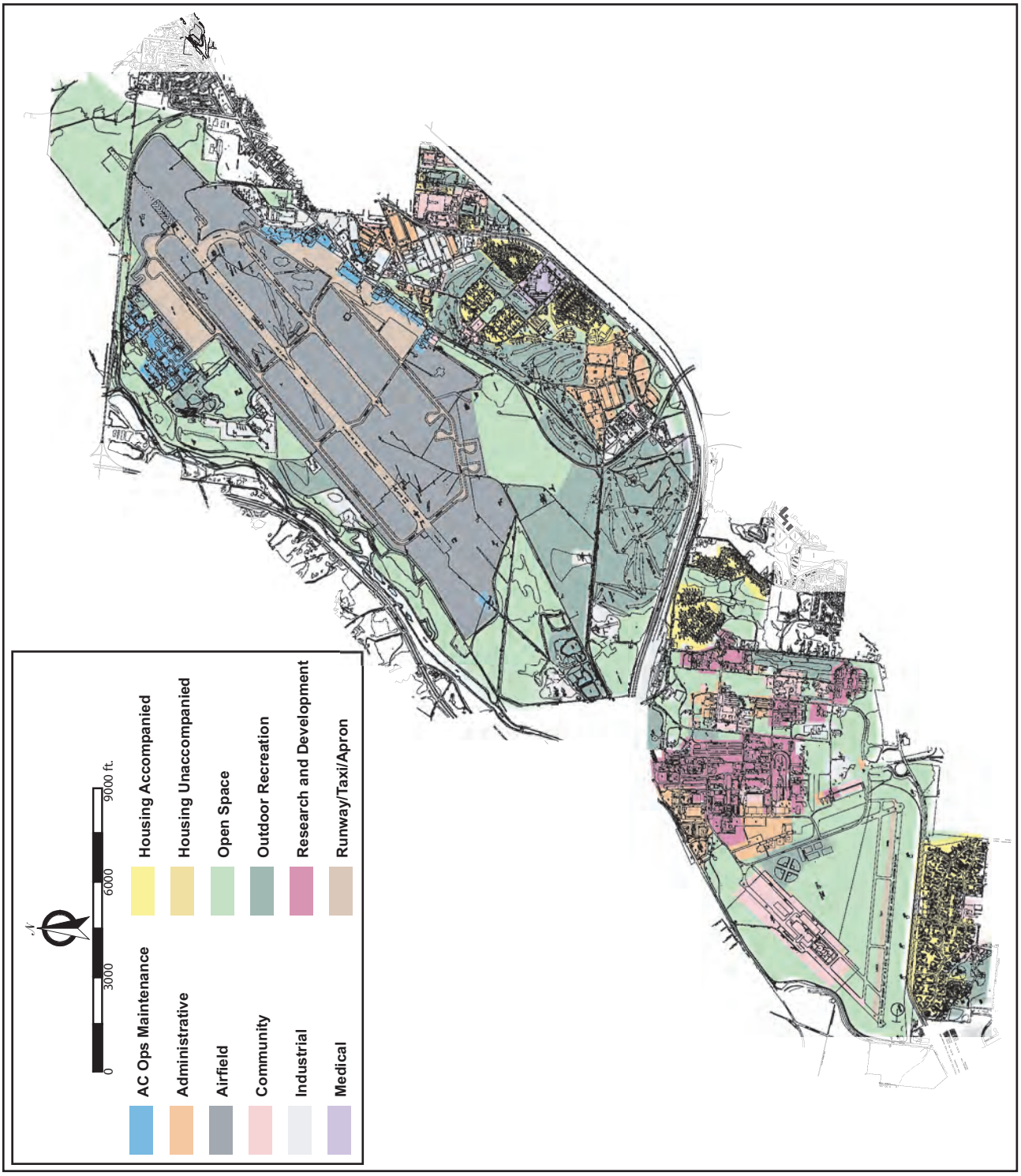

Figure 3-5. Land Uses at Wright-Patterson AFB

Surrounding Land Use. Land uses around Wright-Patterson AFB vary from heavily urbanized to rural agricultural (see Figure 3-6). Most of the urbanized areas are west of the Base and the low-density or agricultural area can be found east of the Base.

To the west of Wright-Patterson AFB is the Dayton metropolitan area. This area is comprised of higher population density cities such as Dayton, Huber Heights, Riverside, Fairborn, and Beavercreek. These cities, along with Wright-Patterson AFB, are within Greene and Montgomery counties. According to the most recent census data, Greene County has a population of 147,886 persons while Montgomery County has 559,062 persons (Bureau of Census 2000a).

To the east of Wright-Patterson AFB is largely open area with agricultural lands interspersed with low-density development located within Miami and Clark counties. According to the most recent census data, Miami County has a population of 98,868 persons while Clark County has 144,742 persons (WPAFB 1995a, Bureau of Census 2000a).

Most of the land surrounding Wright-Patterson AFB that is impacted from Base activities is compatible with Base operations. Many factors contribute to the compatibility of land uses that are within Base activity areas. Development patterns and services available encourage or restrict development in many areas outside incorporated cities, and many areas immediately surrounding the Base are development-restricted due to floodplains or well water protection restrictions. Progressive land use controls have been the most important factor concerning compatible development within noise and APZs at Wright-Patterson AFB (WPAFB 1995a).

The city of Fairborn is contiguous to Wright-Patterson AFB to the east and south. It is a residential community with a large amount of area devoted to residential uses, mostly single family homes. Commercial uses are largely isolated to primary thoroughfares. Due to flight patterns and restrictions, only the northern portion of Fairborn is impacted by noise from current operations. Housing adjacent to the Base boundary and a nearby recreational area are impacted by DNL of 65 to 69 dBA noise contours (WPAFB 1995a).

The city of Beavercreek is south of Fairborn and is contiguous to Wright-Patterson AFB to the south. Beavercreek is mostly residential and characterized as a bedroom community for the city of Dayton and Wright-Patterson AFB. Commercial development can be found in the northern portion of Beavercreek and industrial land use exists around the Interstate (I)-675 and U.S. Highway 35 intersection. No areas of Beavercreek lie within the noise zone contours produced by the current aircraft operations of Wright-Patterson AFB (WPAFB 1995a).

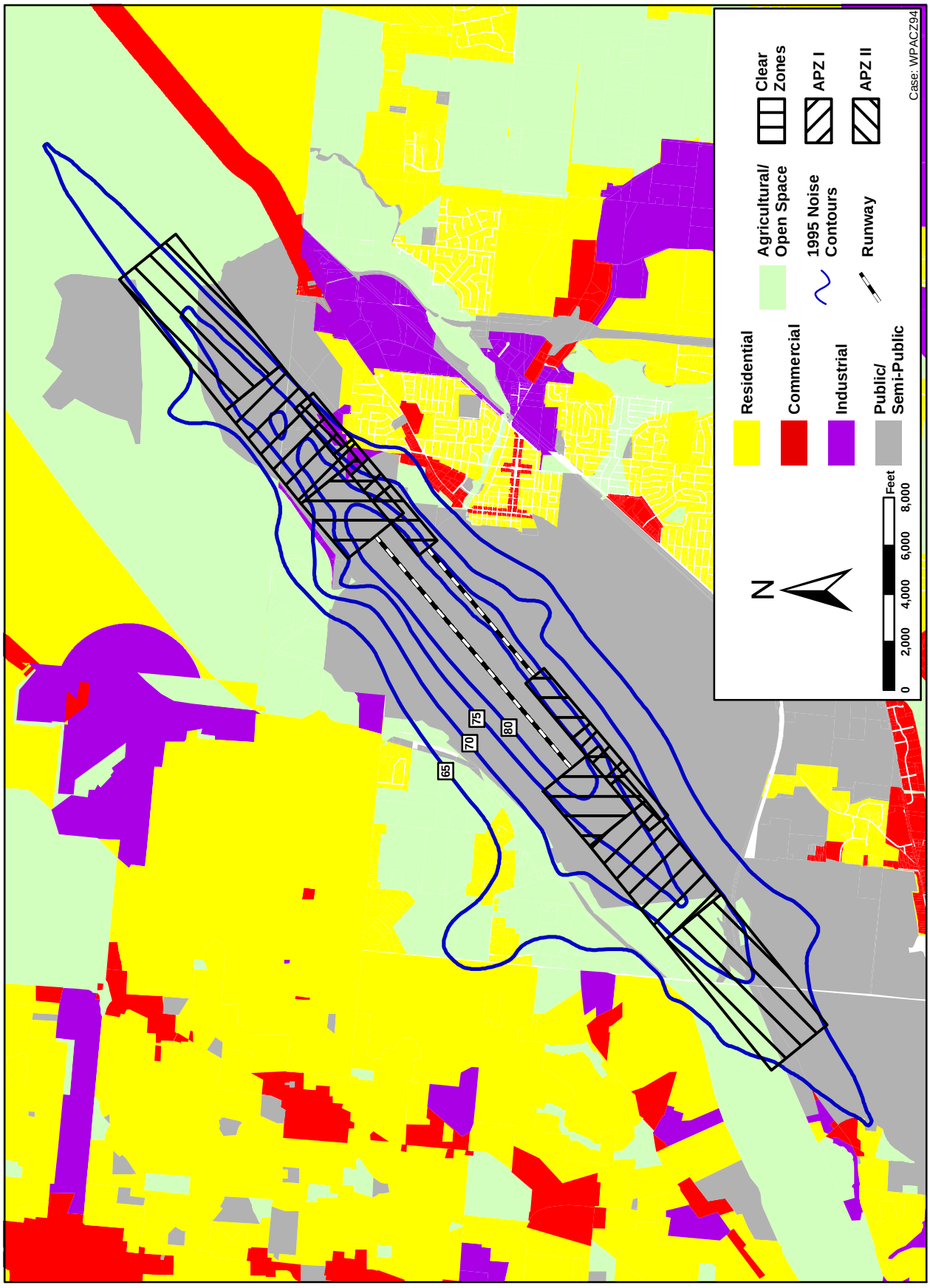

Figure 3-6. Land Uses Surrounding Wright-Patterson AFB

Further west towards the incorporated areas of Dayton, land use becomes increasingly urbanized with more dense areas of residential and commercial land uses. Eastwood Park and the Huffman Reserve are large recreational areas bordered to the north by State Highway 4 and to the south by railroad lines. Northeastern areas of Eastwood Park are within the DNL of 65 to 69 dBA noise contours resulting from Wright-Patterson AFB current operations and APZ II. Portions of Huffman Reserve are within the southern APZs I and II; a large area is within the DNL of 65 to 69 dBA noise contour, and a lesser area is within the DNL of 70 to 74 dBA noise contour (WPAFB 1995a).

Riverside and Huber Heights are northwest of Wright-Patterson AFB. These areas are comprised of varying densities of housing subdivisions and areas where development is restricted by floodplains and well water protection ordinances. Two mobile home parks are also in this area, one immediately west of the southern CZ on Lower Valley Pike and another on the eastern portion of Kitridge Road. Also in the area are residential neighborhoods, agriculture, and low-density residential lands within the DNL of 65 to 74 dBA noise contours. Huber Heights is a high-density residential community that progresses eastward into agricultural land. This area is critical to the operation of the Wright-Patterson AFB flying mission. Continuation of compatible land use within this area is highly desired and should be maintained through local land use planning processes (WPAFB 1995a).

Land area north of Wright-Patterson AFB tends to be agricultural. Some of the area to the north occurs in the Mad River floodplain, which has development restrictions. The communities of Crystal Lake and Medway contain mostly residential, with areas of industrial and commercial, development. Current noise contours extend beyond the runway end, past the I-675 and I-70 interchange. Land uses in this area include open agriculture or industrial, but a small number of residences along Haddix Road are within the DNL of 65 to 74 dBA noise contours (WPAFB 1995a).

3.4 Air Quality

3.4.1 Definition of the Resource

In accordance with Federal CAA requirements, the air quality in a given region or area is measured by the concentration of various pollutants in the atmosphere. The measurements of these "criteria pollutants" in ambient air are expressed in units of parts per million (ppm) or in units of micrograms per cubic meter ($\mu g/m^3$). The air quality in a region is a result not only of the types and quantities of atmospheric pollutants and pollutant sources in an area, but also surface topography, the size of the topological "air basin," and the prevailing meteorological conditions.

The CAA directed USEPA to develop, implement, and enforce strong environmental regulations that would ensure clean and healthy ambient air quality. To protect public health and welfare, USEPA developed numerical concentration-based standards, or National Ambient Air Quality Standards (NAAQS), for pollutants that have been determined to impact human health and the environment. USEPA established both primary and secondary NAAQS under the provisions of the CAA. NAAQS are currently established for six criteria air pollutants: ozone (O_3), carbon monoxide (CO), nitrogen dioxide (NO_2), sulfur dioxide (SO_2), respirable particulate matter (including particulates equal to or less than 10 microns in diameter [PM_{10}] and particulates equal to or less than 2.5 microns in diameter [$PM_{2.5}$]), and lead (Pb). The primary NAAQS represent maximum levels of background air pollution that are considered safe, with an adequate margin of safety to protect public health. Secondary NAAQS represent the maximum pollutant concentration necessary to protect vegetation, crops, and other public resources along with maintaining visibility standards. Table 3-3 presents the primary and secondary NAAQS.

Although O_3 is considered a criteria air pollutant and is measurable in the atmosphere, it is not often considered a regulated air pollutant when calculating emissions because O_3 is typically not emitted directly from most emissions sources. O_3 is formed in the atmosphere by photochemical reactions involving sunlight and previously emitted pollutants or "O_3 precursors." These O_3 precursors consist primarily of nitrogen oxides (NO_x) and volatile organic compounds (VOCs) that are directly emitted from a wide range of emissions sources. For this reason, regulatory agencies attempt to limit atmospheric O_3 concentrations by controlling VOC pollutants (also identified as reactive organic gases) and NO_2.

The CAA and USEPA delegated responsibility for ensuring compliance with NAAQS to the states and local agencies. As such, each state must develop air pollutant control programs and promulgate regulations and rules that focus on meeting NAAQS and maintaining healthy ambient air quality levels. These programs are detailed in SIPs that must be developed by each state or local regulatory agency and approved by USEPA. A SIP is a compilation of regulations, strategies, schedules, and enforcement actions designed to move the state into compliance with all NAAQS. Any changes to the compliance schedule or plan (e.g., new regulations, emissions budgets, controls) must be incorporated into the SIP and approved by USEPA.

The CAA required that USEPA draft general conformity regulations. These regulations are designed to ensure that Federal actions do not impede local efforts to achieve or maintain attainment with the NAAQS.

Table 3-3. National Ambient Air Quality Standards

Pollutant	Standard Value [2]		Standard Type
CARBON MONOXIDE (CO)			
8-hour average	9 ppm	(10 mg/m^3)	Primary and Secondary
1-hour average	35 ppm	(40 mg/m^3)	Primary
NITROGEN DIOXIDE (NO_2)			
Annual arithmetic mean	0.053 ppm	(100 µg/m^3)	Primary and Secondary
OZONE (O_3)			
1-hour average[1]	0.12 ppm	(235 µg/m^3)	Primary and Secondary
8-hour average[1]	0.08 ppm	(157 µg/m^3)	Primary and Secondary
LEAD (PB)			
Quarterly average		1.5 µg/m^3	Primary and Secondary
PARTICULATE < 10 MICROMETERS (PM_{10})			
Annual arithmetic mean		50 µg/m^3	Primary and Secondary
24-hour average		150 µg/m^3	Primary and Secondary
PARTICULATE < 2.5 MICROMETERS ($PM_{2.5}$)			
Annual arithmetic mean		15 µg/m^3	Primary and Secondary
24-hour average		65 µg/m^3	Primary and Secondary
SULFUR DIOXIDE (SO_2)			
Annual arithmetic mean	0.03 ppm	(80 µg/m^3)	Primary
24-hour average	0.14 ppm	(365 µg/m^3)	Primary

Notes:

1 In July 1997, the 8-hour O_3 standard was promulgated and the 1-hour O_3 standard was remanded for all areas, except those designated nonattainment with the 1-hour standard when the O_3 8-hour standard was adopted. In July 2000, the O_3 1-hour standard was reinstated as a result of the Federal lawsuits that were preventing the implementation of the new 8-hour O_3 standard. USEPA estimates that the revised 8-hour O_3 standard rules will be promulgated in 2003–2004. In the interim, no areas can be deemed definitively nonattainment with the new 8-hour standard.

2 Parenthetical value is an approximately equivalent concentration.
ppm: parts per million
mg/m^3: milligrams per cubic meter
µg/m^3: micrograms per cubic meter

The General Conformity Rule and the promulgated regulations found in 40 CFR 93, exempt certain Federal actions from conformity determinations (e.g., contaminated site cleanup and natural disaster response activities). Other Federal actions are assumed to conform if total indirect and direct project emissions are below *de minimis* levels presented in 40 CFR 93.153. The threshold levels (in tons of pollutant per year) depend upon the nonattainment status that USEPA has assigned to a nonattainment area. Once the net change in nonattainment pollutants is calculated, the Federal agency must compare them to the *de minimis* thresholds.

In 1997, USEPA initiated work on new General Conformity rules and guidance to reflect the new 8-hour O_3, $PM_{2.5}$, and regional haze standards that were promulgated in that year. However, because of the litigation and resulting delay in implementing the new O_3 and $PM_{2.5}$ ambient air quality standards, these new conformity requirements have not been completed by USEPA, and no draft rule language is currently available.

Title V of the CAA Amendments of 1990 requires states and local agencies to implement permitting programs for major stationary sources. A major stationary source is a facility (e.g., plant, base, or activity) that has the potential to emit more than 100 tons annually of any one criteria air pollutant, 10 tpy of a hazardous air pollutant, or 25 tpy of any combination of hazardous air pollutants. However, lower pollutant-specific "major source" permitting thresholds apply in nonattainment areas. For example, the Title V permitting threshold for an "extreme" O_3 nonattainment area is 10 tpy of potential VOC or NO_x emissions. The purpose of the permitting rule is to establish regulatory control over large, industrial-type activities and monitor their impact on air quality.

Federal Prevention of Significant Deterioration (PSD) regulations also define air pollutant emissions from proposed major stationary sources or modifications to be "significant" if (1) a proposed project is within 10 kilometers of any Class I area, and (2) regulated pollutant emissions would cause an increase in the 24-hour average concentration of any regulated pollutant in the Class I area of 1 $\mu g/m^3$ or more [40 CFR 52.21(b)(23)(iii)]. PSD regulations also define ambient air increments, limiting the allowable increases to any area's baseline air contaminant concentrations, based on the area's designation as Class I, II, or III [40 CFR 52.21(c)].

3.4.2 Existing Conditions

Regional Climate. The climate of this region of Ohio is humid and temperate with warm summers and cold winters. Average minimum and maximum temperatures are between 21 and 36 degrees Fahrenheit (°F) in January and 45 and 85 °F in July. The average annual precipitation is 38.43 inches, with June typically being the wettest month and October the driest month. The prevailing winds are from the southwest, with average monthly wind speeds between 3 and 7 knots.

Regional Air Quality. Under the authority of the CAA and subsequent regulations, USEPA has divided the country into geographical regions known as Air Quality Control Regions (AQCRs) to evaluate compliance with the NAAQS. Through the CAA, Congress has stated that the prevention and control of air pollution belongs at the state and local level, thus USEPA has delegated

enforcement of the PSD and Title V programs to the OEPA. The OEPA has adopted the NAAQS by reference, thereby requiring the use of the standards within the state of Ohio.

Wright-Patterson AFB. Wright-Patterson AFB is located in Greene and Montgomery counties, which are covered by the Metropolitan Dayton Intrastate AQCR (40 CFR 81.175). Each AQCR is classified as an attainment area or nonattainment area for each of the criteria pollutants depending on whether it meets or fails to meet the NAAQS for the pollutant. Ambient air quality for the Metropolitan Dayton Intrastate AQCR, which was formerly classified as a maintenance area for the 1-hour O_3, is classified as a nonattainment area for the new 8-hour O_3 NAAQS and is designated as an unclassifiable/attainment area for all other criteria pollutants. Unclassifiable areas are those areas that have not had ambient air monitoring and are assumed to be in attainment with NAAQS.

On April 15, 2004, USEPA designated the Dayton–Springfield Metropolitan area as "basic" nonattainment with the 8-hour ozone standard (USEPA 2004). This designation became effective on June 15, 2004. In addition, the state of Ohio has recommended to USEPA Region 5 that this metropolitan area be designated as nonattainment for the very fine $PM_{2.5}$ standard of the future NAAQS. USEPA is expected to issue nonattainment designations for $PM_{2.5}$ on December 15, 2004. If designations are issued on that date, those designations will become effective on February 15, 2006.

These attainment designations have no regulatory effect on the current analysis (see the General Conformity Analysis in Appendix C to this document for further discussion). In addition, the designations are not expected to result in significant changes to stationary source permitting rules pertaining to Proposed Action-related stationary sources that would require permits to construct and operate (e.g., natural gas boilers and aircraft spot painting).

Air quality is typically good in the vicinity of Wright-Patterson AFB, and is generally affected only locally by military and civilian vehicle emissions, particulate pollution from vehicle traffic, fumes from wastewater treatment plants, industrial sources, and construction activities. Mobile sources such as vehicle and aircraft emissions are generally not regulated and are not covered under existing stationary source permitting requirements. Stationary emissions sources at Wright-Patterson AFB include natural gas and coal-fired boilers; research and development sources, such as laboratory fume hoods and test cells; paint spray booths; refueling operations; and emergency power generators.

Wright-Patterson AFB is under the jurisdiction of USEPA Region 5 and the OEPA. The Regional Air Pollution Control Agency (RAPCA), under the jurisdiction of the OEPA, conducts annual

compliance inspections at Wright-Patterson AFB. The Base has long had an aggressive program of internal audits and inspections to ensure continual compliance with all applicable air permit terms and conditions. Detailed records are maintained to demonstrate compliance with emission limits, and reports are submitted in a timely manner to the local regulatory agency.

The Wright-Patterson AFB air emissions inventory includes over 1,400 emissions sources. Of these, approximately 1,050 are included in the Base's Title V permit application, which was originally submitted to the OEPA in February 1996 in accordance with CAA requirements. Many of the Title V sources are insignificant, including emergency generators and laboratory fume hoods. There are also 29 permitted emissions units, most of which are boilers and paint spray booths. The OEPA finalized the Title V Operating Permit for Wright-Patterson AFB in January 2004 with an effective date of February 17, 2004 (OEPA 2004a).

445th Airlift Wing. The 445 AW stationary air emissions sources are included in the Wright-Patterson Title V Operating Permit. Title V permitted emissions units within the 455 AW compound are listed below by Title V emission unit ID number (OEPA 2004a):

- B604 – 18.3 million British thermal units per hours (MMBtu/hr) Dual Fuel Boiler in Building 4019
- B605 – 18.3 MMBtu/hr Dual Fuel Boiler in Building 4019
- B660 – 18.75 MMBtu/hr Dual Fuel Boiler in Building 4019
- K608 – Fuel Cell Maintenance Facility in Building 4020
- K609 – Corrosion Control (touch-up painting) in Building 4024
- K610 – Corrosion Control (touch-up painting) in Building 4026
- K617 – Surface Coating Paint Spray Booth in Building 4024

Of these permitted emissions units, only K-609, touch-up painting in Hangar 4024 is expected to be appreciably affected by the Proposed Action. Because Hangar 4024 is not large enough to accommodate a C-5 airframe, this touch-up operation would be relocated to the proposed new multipurpose hangar. The Wright-Patterson AFB Title V permit would need to be modified in order to relocate this process to a new hangar. However, the relocated process would be substantially similar to the existing process, and existing emissions limits and permit conditions would be expected to be unchanged with this relocation.

A number of insignificant emissions units listed in the Wright-Patterson AFB Title V permit are located within the 455 AW compound. These include

- 9 Emergency Backup Generators
- 1 Fuel Dispensing Facility
- 1 Truck Fuel Loading Rack
- 1 Aircraft Fuel Loading Hydrant System
- 4 Touch-Up Painting/Stenciling Operations
- 1 Fire Training Facility
- 4 Cold Cleaner Degreasers
- 1 Paint Spray Gun Cleaner
- 20 Storage Tanks
- 1 Boiler (< 10 MMBtu/hr)
- 16 Hand-Wipe Cleaning Operations
- 3 Abrasive Blasters
- 1 Portable Wash Rack
- 2 Pressure Washers

Insignificant sources listed in the Title V permit have no permit conditions or reporting requirements. Additions, removals, and relocations of these insignificant sources (e.g., realignment of fuel hydrants to fit C-5 parking configuration) do not require a modification of the permit. They are handled as routine administrational changes through update letters sent to the OEPA, Division of Air Pollution Control (Strobbe 2004).

3.5 Safety

3.5.1 Definition of the Resource

A safe environment is one in which there is no, or an optimally reduced, potential for death, serious bodily injury or illness, or property damage. The public has little access to the construction activities associated with the Proposed Action, so the primary safety concern is the potential for aircraft crashes and loss of life and property damage. Aircraft safety focuses on matters such as the potential for aircraft mishaps, airspace congestion, BASH, munitions handling and use, flight obstructions, weather, and fire risks.

Aircraft mishaps might involve midair collisions with other aircraft; collisions with objects such as towers, buildings, or mountains; weather-related accidents; and bird/wildlife-aircraft collisions. The environment for air safety is based on the physical risks associated with aircraft flight and current

military operational procedures concerning air safety. Safe flying procedures, adherence to flight rules, and knowledge of emergency procedures form consistent and repeated aspects of training for all aircrews, including those at Wright-Patterson AFB. Since the inception of the USAF in 1947, aircraft accidents have steadily declined each year.

Safety and accident hazards can often be identified and reduced or eliminated. Necessary elements for an accident-prone situation or environment include the presence of the hazard itself together with the exposed (and possibly susceptible) population. The degree of exposure depends primarily on the proximity of the hazard to the population. Activities that can be hazardous include transportation, maintenance and repair activities, and the creation of highly noisy environs. The proper operation, maintenance, and repair of vehicles and equipment carry important safety implications. Any facility or human-use area with potential explosive or other rapid oxidation processes creates unsafe environments for nearby populations. Extremely noisy environments can also mask verbal or mechanical warning signals such as sirens, bells, or horns.

The following provides additional information on specific safety hazards associated with training flights.

Aircraft Safety. The existing environment for air safety is based on the physical risks associated with aircraft flight and current military operation procedures concerning air safety. Obstructions to flights, which include things such as towers and power transmission lines, represent safety concerns for aircrews, especially those engaged in low-altitude flight training. Aircrews are briefed and familiarized with potential obstructions along their routes before undertaking a mission. Furthermore, DOD FLIP and aeronautical charts identify the location of such hazards and indicate the required horizontal and/or vertical separation distances to ensure safety.

Hazardous weather conditions can pose safety hazards and influence a pilot to alter flight. Pilots consult the National Weather Service or weather services at local airports to obtain preflight weather information. Adverse weather conditions of concern include tornadoes, thunderstorms, hail, severe turbulence, dust storms, and wind shear. The evaluation of potential hazards of weather conditions rests in a pilot's sound discretion based on knowledge of available information, experience, and the operational limits of the aircraft.

The U.S. Air Force Safety Center (AFSC) has defined four classifications of mishaps: Classes A, B, and C; and High Accident Potentials (HAPs). Class A mishaps result in a total cost in excess of $1 million for injury, occupational illness, and property damage; a fatality or permanent total

disability; or destruction or damage beyond economical repair to USAF aircraft. Class B mishaps result in a total cost in excess of $200,000 (up to $1 million) in property damage, permanent partial disability, or hospitalization of five or more personnel. Class C mishaps result in total damage that costs in excess of $10,000 (up to $200,000), or an injury or occupational illness that results in a loss of workers productivity greater than 8 hours. Mishaps not meeting the definitions of Class A, B, or C, but, because of damage or injury necessitate USAF reporting, are classified as HAPs.

BASH are a safety concern due to the potential damage that a strike might have on the aircraft or potential injury to aircrews. Birds might be encountered at altitudes of 30,000 feet and higher. However, most birds fly close to ground level, and approximately 95 percent of all reported incidents in which a USAF aircraft has struck a bird have been below 3,000 feet AGL. Approximately half of these bird strikes occur in the airport environment, and approximately one-third occur during low-altitude training. Strike rates rise substantially as altitude decreases.

The USAF devotes considerable attention to avoiding the possibility of bird/wildlife-aircraft strikes. It has conducted a worldwide program for decades to study bird migrations, bird flight patterns, and past strikes to develop predictions of where and when bird/wildlife-aircraft strikes might occur. This program, which consistently updates the data, also defines avoidance procedures through a Bird Avoidance Model (BAM). Each time an aircrew plans a training sortie along an established training route or other training airspace, they use the BAM to define altitudes and locations to avoid. Use of this model has minimized BASH. Each base or flying unit also develops and maintains a bird/wildlife-aircraft avoidance plan that dictates the location and timing of avoidance measures within the airspace used by the base or unit.

Munitions and Explosive Safety. Explosive safety zones (ESZs) are required for areas where ordinance are stored or handled. ESZs are typically determined based upon the net explosive weight of the ordinance to be stored or handled and the blast resistance properties of the magazine. Explosive Safety Quantity Distance (ESQD) arcs that delineate the extents of each ESZ are constructed. ESZ and ESQD requirements are specified in Air Force Manual 91-202, *Explosive Safety Standards*.

Construction and Demolition Safety. Construction site safety is largely a matter of adherence to regulatory requirements imposed for the benefit of employees and implementation of operational practices that reduce risks of illness, injury, death, and property damage. The health and safety of onsite military and civilian workers are safeguarded by numerous DOD and USAF regulations

designed to comply with standards issued by the Occupational Safety and Health Administration (OSHA) and USEPA. These standards specify the amount and type of training required for industrial workers, the use of protective equipment and clothing, engineering controls, and maximum exposure limits for workplace stressors.

3.5.2 Existing Conditions

Fire Hazards and Public Safety. The Fire Department at Wright-Patterson AFB provides fire, crash, rescue, and structural fire protection at the Base. The 445 AW abides by a general safety policy relating to the performance of all activities at the Base. Individuals, supervisors, managers, and commanders are expected to give full support to safety efforts. Safety awareness and strict compliance with established safety standards are expected.

Aircraft Safety. Risks associated with takeoffs and landings at Wright-Patterson AFB are presented in the 1995 AICUZ Study for the Base, which was developed to address safety issues and to identify hazard potential due to aircraft accidents, obstructions to navigation, and incompatible land uses based on exposure levels to aircraft noise in the surrounding area. The Wright-Patterson AFB AICUZ Study also defines obstruction-free areas and APZs relative to runways and taxiways, which in turn results in constraints in the siting and location of facilities on Base (WPAFB 1995a).

Air safety is based on the physical risks associated with aircraft flight and current military operational procedures concerning air safety. Historical mishap databases enable the military to calculate the mishap rates for each type of aircraft. These rates are based on the estimated flying time that an aircraft is expected to be in the airspace, the accident rate per 100,000 flying hours for that aircraft, and the annual flying hours for that aircraft. Historical data on C-141 mishaps are listed in Table 3-4, which shows that the lifetime rate of Class A and Class B mishaps combined is less than one mishap per 100,000 hours of flight time for the C-141 aircraft (AFSC 2004a).

An aircraft mishap can cause fire and environmental contamination. Military aircraft have the capability to carry large amounts of fuel that can ignite in the event of an aircraft crash. Initial response to an aircraft accident is the responsibility of the civilian authorities nearest the crash site. These authorities would provide emergency services such as fire, police, and medical assistance, as necessary. The civilian agency responding to an aircraft accident is responsible for determining what response actions they are capable of performing. If the responding unit is not capable of performing certain response actions, they request assistance from the nearest civilian agency capable of performing the required response. In the event of an aircraft mishap, these authorities would notify

the nearest USAF installation. Upon notification of the aircraft accident, the commanding officer of the nearest USAF installation dispatches a disaster response force team. The response team would provide security, medical, fire, legal, munitions, and mortuary services, as required. The response team would also assist with evacuation, accident evaluation and investigation, and retrieval of classified materials or equipment, as well as protective measures such as munitions disposal and hazardous/toxic materials removal or treatment. When necessary, the disaster response force team would coordinate activities with other regional response forces to ensure all personnel and equipment are dispatched for proper control of the accident site.

Table 3-4. Historical Data on C-141 Mishaps (FY 91–FY 02)
Current as of November 2, 2002

Year	Class A		Class B		Fatal		Hours Flown	Cumulative Hours [2]
	No.	Rate [1]	No.	Rate [1]	Pilot	All		
FY 91	0	0.00	1	2.28	0	0	442,406	9,220,662
FY 92	0	0.00	0	0.00	0	0	226,312	9,446,974
FY 93	1	0.49	0	0.00	4	13	203,264	9,650,238
FY 94	0	0.00	0	0.00	0	0	127,938	9,778,176
FY 95	0	0.00	0	0.00	0	0	157,059	9,935,235
FY 96	0	0.00	0	0.00	0	0	146,417	10,081,652
FY 97	1	0.83	1	0.83	2	9	121,043	10,202,695
FY 98	1	0.97	0	0.00	0	0	102,917	10,305,612
FY 99	0	0.00	1	1.13	0	0	88,888	10,394,500
FY 00	0	0.00	5	7.74	0	0	64,581	10,459,081
FY 01	0	0.00	3	5.79	0	0	51,807	10,510,888
FY 02	0	0.00	1	2.28	0	0	43,780	10,554,668
Lifetime [2]	**34**	**0.32**	**39**	**0.37**	**34**	**161**	**10,554,668**	

Source: AFSC 2004a
Notes:
[1] Rate of mishap per 100,000 hours flown.
[2] Cumulative hours represent lifetime mishap record totals from the beginning of C-141 operations (FY 64) to present.

Bird/Wildlife-Aircraft Strike Hazard. The 445 AW at Wright-Patterson AFB actively implements a BASH Plan, thereby reducing the potential for a bird/wildlife strike to occur at the Base by providing procedures for (WPAFB 1998 and 2002)

- The Base's Bird Hazard Working Group.
- Altering or discontinuing flying operations based on reported hazardous bird activity.

- Disseminating information to all assigned and transient aircrews for specific bird hazards and procedures for avoidance.
- Eliminating or reducing environmental conditions that attract birds to the airfield.
- Dispersing birds on the airfield.

The BASH Plan includes maintenance specifications for grass mowing on the airfield to range from 7 to 14 inches, seasonal inspection requirements for grain-type grasses that attract high-threat avian species, and periodic inspection requirements for ponding and proper drainage on the airfield whenever possible to reduce insect breeding. The BASH Plan also established a Bird Hazard Warning System to provide a means for immediate exchange of information between the ground operations and aircrews concerning the existence of birds that pose a hazard (WPAFB 1998 and 2002). BASH reduction techniques currently listed in the Wright-Patterson AFB BASH Plan include abating nuisance avian species using pyrotechnics and depredation, when necessary.

At the Base, there are several common bird types that might be present and pose a hazard: waterfowl (ducks and geese), raptors (hawks and birds of prey), pigeons, doves, meadowlarks, blackbirds, starlings, and killdeer. Migratory waterfowl (ducks, geese, and swans) pose a threat to low-flying aircraft. Waterfowl vary considerably in size, from 1 to 2 pounds for ducks, 5 to 8 pounds for geese, and up to 20 pounds for most swans. Waterfowl are usually only a hazard during the migratory season. Waterfowl typically migrate at night, and generally fly between 1,500 and 3,000 feet AGL during the fall migration and 1,000 to 3,000 feet AGL during spring migration. In addition, other large migratory avian species, such as turkey vultures and gulls, pose a threat to military aircraft.

Strike rates rise dramatically as altitude decreases, which is partly due to the greater number of low-altitude missions, but mostly because birds are commonly active close to the ground. Any gain in altitude above 1,000 feet represents a substantially reduced threat of a bird strike (AMC 2002). The C-141C aircraft at Wright-Patterson AFB are not flown regularly on low-level routes, which are less than 3,000 feet AGL. Missions conducted at heights above 3,000 feet AGL account for less than 6 percent of all USAF wildlife strikes where altitude was known (AFSC 2004b).

BAMs are used to analyze BASH visually during flight planning. The majority of costs incurred by the USAF occur during the fall migration of waterfowl and raptors. On average in the month of September, 13.14 percent of all bird/wildlife-aircraft strikes occur, accounting for 52.23 percent of USAF BASH costs (AFSC 2004c). In addition, most bird/wildife-aircraft strikes occur after 10:00 a.m. (AFSC 2004d). Using online BAM software to calculate avian densities during the highest risk months and at high-risk day times for Wright-Patterson AFB, avian density over the ROI is shown as

low to moderate (USAF 2004). No severe avian densities are shown for these high-risk seasons or day times.

Several incidences of bird-aircraft strikes have been reported at Wright-Patterson AFB. The Flight Safety Officer prepares bird strike reports that include the date and time of each strike, conditions, aircraft model, number of birds, bird species, and altitude and location at the time of the strike (WPAFB 1998 and 2002). The potential exists for future bird strikes although current BASH Plan and U.S. Department of Agriculture–Wildlife Services (USDA–WS) management strategies and protocols continue to be implemented. The USAF BASH Team maintains historic records of bird/wildlife-aircraft strikes. A summary of the strikes that have occurred over the last 5 years at Wright-Patterson AFB is presented in Table 3-5.

Wright-Patterson AFB maintains a USFWS depredation permit that specifies numbers of birds that may be killed by species as part of an overall management program (WPAFB 2001a). However, depredation permits are not required for killing English house sparrows *(Passer domesticus)*, European starlings *(Sturnus vulgaris)*, common pigeons or rock doves *(Columba livia)*, and mute swans *(Cygnus olor)*. In addition, 50 CFR 21.43 excludes the need for a depredation permit for red-winged blackbirds *(Agelaius phoeniceus)*, rusty blackbirds *(Euphagus carolinus)*, brown-headed cowbirds *(Molothrus ater)*, common grackle *(Quiscalus quiscula)*, and American crows *(Corvus brachyrhynchos)* when concentrated in such numbers and manner as to constitute a health hazard or other nuisance. In addition, a Wildlife Survey and Airfield Management Plan was developed to provide information regarding bird and mammal activities on the airfield and detail short- and long-term ways of reducing BASH potential (WPAFB 2001a). A Cooperative Services Agreement between Wright-Patterson AFB and USDA–WS was finalized in September 2001 to obtain USDA–WS assistance in reducing BASH potential (WPAFB 2001a).

Table 3-5. Bird-Aircraft Strikes at Wright-Patterson AFB (1999–2003)

Year	Number of Bird-Aircraft Strikes	Number of Strikes Involving C-141 Aircraft
1999	26	5
2000	38	14
2001	33	14
2002	18	7
2003	21	13

Source: AFSC 2004e

Munitions and Explosives Safety. There are several areas that are constrained by ESQD clear zones in the Patterson Field area (WPAFB 2001b). The weapons storage area near the west ramp provides space for conventional munitions maintenance and storage. The ESQD CZ for inhabited buildings is 1,250 feet, while a smaller arc of 750 feet limits encroachment from Bass Lake's outdoor recreation activities (WPAFB 2001b). Four hot cargo pads are located along Taxiway B. The pads provide space for loading and unloading of cargo aircraft that are transporting munitions and have 2,115-foot ESQD CZs for inhabited buildings associated with them. The southernmost hot cargo pad has reduced quantities of explosives, so the ESQD is 1,610 feet (WPAFB 2001b). Fourteen contingency hot cargo pads are provided along Taxiway A. These pads require a 1,250-foot ESQD CZ (WPAFB 2001b). Less restrictive ESQDs are along the west parking apron. An arm/dearm and hung ordnance pad is provided at both ends of Taxiway B.

Construction and Demolition Safety. All contractors performing construction activities are responsible for following ground safety regulations and worker compensation programs, and are required to conduct construction activities in a manner that does not pose any risk to workers or personnel. Industrial hygiene programs address exposure to hazardous materials, use of personal protective equipment, and availability of Material Safety Data Sheets. Industrial hygiene is the responsibility of contractors, as applicable. Contractor responsibilities are to review potentially hazardous workplace operations; to monitor exposure to workplace chemical (e.g., asbestos, lead, hazardous materials), physical (e.g., noise propagation), and biological (e.g., infectious waste) agents; to recommend and evaluate controls (e.g., ventilation, respirators) to ensure personnel are properly protected or unexposed; and to ensure a medical surveillance program is in place to perform occupational health physicals for those workers subject to any accidental chemical exposures.

3.6 Geological Resources

3.6.1 Definition of the Resources

Geological resources consist of the earth's surface and subsurface materials. Within a given physiographic province, these resources typically are described in terms of topography, soils, geology, minerals, and, where applicable, paleontology.

Topography pertains to the general shape and arrangement of a land surface, including its height and the position of its natural and human-made features.

Geology is the study of the earth's composition and provides information on the structure and configuration of surface and subsurface features. Such information derives from field analysis based

on observations of the surface and borings to identify subsurface composition. Hydrogeology extends the study of the subsurface to water-bearing structures. Hydrogeological information helps in the assessment of groundwater quality and quantity and its movement.

Soils are the unconsolidated materials overlying bedrock or other parent material. Soils typically are described in terms of their complex type, slope, and physical characteristics. Differences among soil types in terms of their structure, elasticity, strength, shrink-swell potential, and erosion potential affect their abilities to support certain applications or uses. In appropriate cases, soils properties must be examined for their compatibility with particular construction activities or types of land use.

3.6.2 Existing Conditions

Topography and Geology. The topography of Wright-Patterson AFB is flat with some rolling hills. The Base is on the broad alluvial plain of the Mad River Valley which overlies Ordovician-age Richmond shale and limestone bedrock (WPAFB 2001b). The elevation on Base ranges from approximately 760 to 980 feet above MSL (WPAFB 2001b).

Wright-Patterson AFB is within the glaciated till plain region of southwestern Ohio, an area within the Central Lowlands Physiographic Province. The Central Lowlands province is characterized by low rolling hills, level plains, and flat alluvial valleys (WPAFB 2001a).

Natural Hazards. The state of Ohio is characterized by a low level of seismic activity (USGS 2002). The Dayton, Ohio, area does not typically experience earthquakes because of its location in relation to fault zones (Hansen 2002). Northwest Ohio had a series of historic earthquakes in the late 1800s to mid 1900s. The majority of these earthquakes were located in Auglaize and Shelby counties, which are approximately 45 miles from Greene County, Ohio (Hansen 2002).

Soils. Surface soil at Wright-Patterson AFB formed on unconsolidated deposits, primarily alluvium, glacial outwash, glacial till, and loess (WPAFB 2001a). Development and substantial earthmoving activities have altered the natural soil characteristics at Wright-Patterson AFB, making precise classifications difficult. The U.S. Department of Agriculture-Natural Resources Conservation Service (NRCS), formerly the Soil Conservation Service, mapped most of Wright-Patterson AFB as urban land complexes. Major soil complexes represented at Wright-Patterson AFB include

- Warsaw-Fill land complex
- Sloan-Fill land complex
- Linwood muck

- Westland-Urban land complex
- Miamian-Urban land complex
- Raub silt loam
- Ockley-Urban land complex

These soil complexes vary from well-drained loams underlying most of the Patterson Field airfield to very poorly drained silty clay loams and muck soils in depressional areas, floodplains, and swales (WPAFB 2001b).

Soils in a few scattered areas of Wright-Patterson AFB are classified by NRCS as prime farmland soils. NRCS defines prime farmland as soils having the best combination of physical and chemical properties to produce sustained high crop yields when managed according to acceptable farming methods. A designation of areas with prime farmland does not legally constrain other land uses. The most important area of prime farmland on Wright-Patterson AFB is associated with the agricultural outleased area northeast of SR-235 between Haddix and Sandhill Roads (WPAFB 2001b).

3.7 Water Resources

3.7.1 Definition of the Resource

Water resources include groundwater, surface water, and floodplains. Evaluation of water resources examines the quantity and quality of the resource and its demand for various purposes.

***Groundwater*.** Groundwater consists of the subsurface hydrologic resources. It is an essential resource often used for potable water consumption, agricultural irrigation, and industrial applications. Groundwater typically can be described in terms of its depth from the surface, aquifer or well capacity, water quality, surrounding geologic composition, and recharge rate.

***Surface Water*.** Surface water resources consist of lakes, rivers, and streams. Surface water is important for its contributions to the economic, ecological, recreational, and human health of a community or locale.

Storm water is an important component of surface water systems because of its potential to introduce sediments and other contaminants that could degrade lakes, rivers, and streams. Storm water flows, which may be exacerbated by high proportions of impervious surfaces associated with buildings, roads, and parking lots, are important to the management of surface water. Storm water systems convey precipitation away from developed sites to appropriate receiving surface waters. Various systems and devices might be used to slow the movement of water. For instance, a large, sudden flow

could scour a streambed and harm biological resources. Storm water systems provide the benefit of reducing sediments and other contaminants that would otherwise flow directly into surface waters. Failure to size storm water systems appropriately to hold or delay conveyance of the largest predicted precipitation event often leads to downstream flooding and the environmental and economic damages associated with flooding. Higher densities of development, such as those found in urban areas, require greater degrees of storm water management because of the higher proportions of impervious surfaces that occur in urban centers.

Floodplains. Floodplains are areas of low-level ground present along rivers, stream channels, or coastal waters. Such lands might be subject to periodic or infrequent inundation due to rain or melting snow. Risk of flooding typically hinges on local topography, the frequency of precipitation events, and the size of the watershed above the floodplain. Flood potential is evaluated by the Federal Emergency Management Agency (FEMA), which defines the 100-year floodplain. The 100-year floodplain is the area that has a 1 percent chance of inundation by a flood event in a given year. Certain facilities inherently pose too great a risk to be located in either the 100- or 500-year floodplain, such as hospitals, schools, or storage buildings for irreplaceable records. Federal, state, and local regulations often limit floodplain development to passive uses, such as recreational and preservation activities, to reduce the risks to human health and safety.

EO 11988, *Floodplain Management*, requires Federal agencies to determine whether a proposed action would occur within a floodplain. This determination typically involves consultation of appropriate FEMA Flood Insurance Rate Maps, which contain enough general information to determine the relationship of the project area to nearby floodplains. EO 11988 directs Federal agencies to avoid floodplains unless the agency determines that there is no practicable alternative. Where the only practicable alternative is to site in a floodplain, a specific step-by-step process must be followed to comply with EO 11988 outlined in the FEMA document *Further Advice on EO 11988 Floodplain Management*. As a planning tool, the NEPA process incorporates floodplain management through analysis and public coordination of the EA.

3.7.2 Existing Conditions

Groundwater. Wright-Patterson AFB is regionally located in the Great Miami River Valley, which is filled with glacially deposited sand and gravel. The glacial outwash deposits are very permeable and exhibit high transmissivity and hydraulic conductivity. The resulting aquifer system, collectively called the Miami Valley Buried Aquifer, is a highly productive source of water for the millions of people in southwest Ohio. USEPA designated the Miami Valley Buried Aquifer system as a sole-

source aquifer in 1988, meaning that all new projects must be approved by USEPA Region 5 to ensure its continued use as a drinking water supply (53 Federal Register 15876). The buried aquifer system provides drinking water for more than 1.6 million people in southwest Ohio (Debrewer et al. 2000). Groundwater can also be found in large volumes in the Silurian-age (415 to 465 million years ago) limestone and dolomite bedrock underneath the buried valley aquifer system. Private wells and smaller public systems typically use this bedrock aquifer because, though not as productive as the buried aquifer, it is adequate for such uses (MCD 2002). Underneath the limestone and dolomite bedrock is Ordovician-age (465 to 510 millions year ago) bedrock shales and limestones of the Richmond Group. The lower bedrock aquifer system generally produces less than 5 gallons per minute and is only productive enough for livestock use.

The buried valley aquifers coincide with the present Great Miami River and its tributaries. Water underground generally follows the same flows as surface waters with upland areas serving as recharge areas and groundwater divides (MCD 2002). At Wright-Patterson AFB, the Mad River follows the course of the Mad River Buried Aquifer, part of the Miami Valley Buried Aquifer system. South of Huffman Dam (a flood control dam that is managed by the Miami Conservancy District [MCD]), a till zone divides the Mad River Buried Aquifer into an upper water table unit and a lower confined unit. However, north of the dam and in other parts of the buried valley aquifer, till zones occur less frequently as discontinuous, less-permeable zones within the more permeable outwash deposits (WPAFB 1995b). The glacial deposits have been reported to be up to 250 feet thick in the buried rock valley underlying Areas A and C of Wright-Patterson AFB. The depth to the water table occurs approximately 10 to 20 feet below ground surface across most of Areas A and C (WPAFB 1995b). Vertical hydraulic gradients vary throughout the area, and both upward and downward gradients have been recorded in nested monitoring wells at Wright-Patterson AFB. Most of the wells in the outwash deposits yield between 750 and 1,500 gallons per minute, but can vary from less than 200 to more than 4,000 gallons per minute (WPAFB 1995b). Because of the limestone and dolomite bedrock, groundwater is typically hard (Debrewer et al. 2000).

Surface Water. Wright-Patterson AFB is in the Mad River Valley. The Mad River originates approximately 40 miles north of Springfield, Ohio, and flows south and southwest past Wright-Patterson AFB to its confluence with the Great Miami River in Dayton, Ohio. The Great Miami River flows into the Ohio River, then the Mississippi River. Sustained flow of the Mad River originates from groundwater discharge of glacial deposits upstream of Huffman Dam. The Mad River approaches Wright-Patterson AFB from the north and flows along the western border of Area C (see Figure 3-7).

The OEPA has designated the Mad River through Wright-Patterson AFB suitable for Warmwater Habitat, Agricultural Water Supply, Industrial Water Supply, and Primary Contact Recreation (Ohio Administrative Code Chapter 3745-1-21). OEPA has identified the lower segment of the Mad River, which flows through Wright-Patterson AFB, as an impaired water under Section 303(d) of the CWA for not meeting aquatic life and recreation use standards (OEPA 2004b). The total maximum daily load of effluent (TMDL) that the water body could support is expected to be completed in 2005. A TMDL specifies the maximum amount of a pollutant that a waterbody can receive and still meet water quality standards, and allocates pollutant loadings among point and nonpoint pollutant sources. Once the TMDL has been completed for the impaired segment of Mad River in 2005, closer monitoring and regulation of contributing pollutants will be necessary.

There are several recreational lakes in Area C of Wright-Patterson AFB. The largest is Bass Lake in the northeastern corner of Area C (see Figure 3-7). The Twin Lakes Recreational Area, comprised of East Twin Lake, West Twin Lake, and Gravel Lake, is located in the southwest corner of Area C (WPAFB 1999a). Trout and Hebble creeks are minor surface water features located in Areas A and C. They flow in a general westward direction into the Mad River. Mud Run is another small surface water feature joining the Mad River along the Base's northern border.

The Wright-Patterson AFB Storm Water Pollution Prevention Plan (SWPPP) (prepared to comply with the Federal CWA and with the Ohio Water Pollution Control Act) provides detailed descriptions of storm drainage areas and their associated outfalls, potential storm water pollution sources, and material management approaches to reduce potential storm water contamination. An individual permit with OEPA (NPDES OH0010243) covers the Wright-Patterson AFB storm water program. The SWPPP provides specific Best Management Practices (BMPs) to prevent surface water contamination from activities such as storing and transferring of fuels, storage of coal piles, storage and use of deicing fluids, storage and use of lubrication oils and maintenance fluids, solid and hazardous waste storage, and salt and scale inhibitor storage. Some storm water also enters the Base from surrounding communities and areas (WPAFB 2001b).

Wright-Patterson AFB's NPDES permit was recently revised and became effective on June 1, 2004. The SWPPP is also under revision by the Base. One of the changes in the Base's NPDES permit is monitoring for glycol (aircraft deicing fluid) at six outfalls (refer to Section 3.12.2 for information on propylene glycol and its current use at Wright-Patterson AFB). The Food and Drug Administration has classified propylene glycol as "generally recognized as safe" for consumption (HHS 1997). However, propylene glycol in water bodies consumes oxygen when breaking down. Large concentrations of propylene glycol can consume available oxygen and negatively impact aquatic life

(HHS 1997). Currently, the 445 AW captures approximately 40 percent of their deicing runoff, and the remainder is discharged into Bass Lake and other drainage ways. Ultimately, 70 percent of deicing fluid will be captured for Wright-Patterson to be in compliance with the NPDES permit. This is further discussed in Section 4.7.2.

Twenty defined drainage or "Outfall Areas" occur on Base (WPAFB 2001b). Outfalls in Areas A and C discharge either directly to the Mad River or indirectly to the Mad River via Hebble Creek, Trout Creek, Mud Run, or other minor surface drainages (WPAFB 2001b). Figure 3-7 indicates the locations of the 23 NPDES monitoring points on Base (88 ABW/EM 2004). Table 3-6 provides specific information about Points 13 to 18, which primarily drain Area C. These outfalls will be monitored for glycol under the revised NPDES permit.

Floodplains. A large portion of Wright-Patterson AFB lies within the Mad River floodplain. Most of Area C is behind Huffman Dam and subject to flooding. The 10-year floodplain is at 804.7 feet above MSL, and the 100-year floodplain is at 814.3 feet above MSL. Portions of the parking apron, runway, and operation buildings are in the 100-year floodplain (refer to Figure 3-7).

Table 3-6. Drainage Areas Monitored under NPDES Permit

Drainage Basin Number [1]	Description
13	Drains the East Ramp and includes aircraft operations and maintenance and runway/taxi/ apron pavement. Runoff discharges south and west to Hebble Creek near the intersection of Skeel Avenue and Wright Avenue.
14	Drains the East Airfield and includes airfield pavement and runway/taxi/apron pavement, and small areas of open space aircraft operations and maintenance. Discharges west to Trout Creek near the intersection of Pylon Road and Marl Avenue.
15	Drains a large portion of the West Airfield and includes aircraft pavement and runway/taxi/ apron pavement. Discharges west to Trout Creek along Symmes Road.
16	Drains a small portion of the West Airfield and includes airfield pavement and runway/taxi/ apron pavement. Discharges towards the north, north of Riverview Road.
17	Drains a large portion of the West Airfield and includes airfield pavement and runway/taxi/ apron pavement. Discharges north to the Mad River.
18	Drains the West Ramp, primarily runway/taxi/ apron pavement and some of the airfield pavement. Discharges west to Bass Lake.

Source: 88 ABW/EM 2004

1 Drainage basin number corresponds to NPDES monitoring points indicated on Figure 3-7.

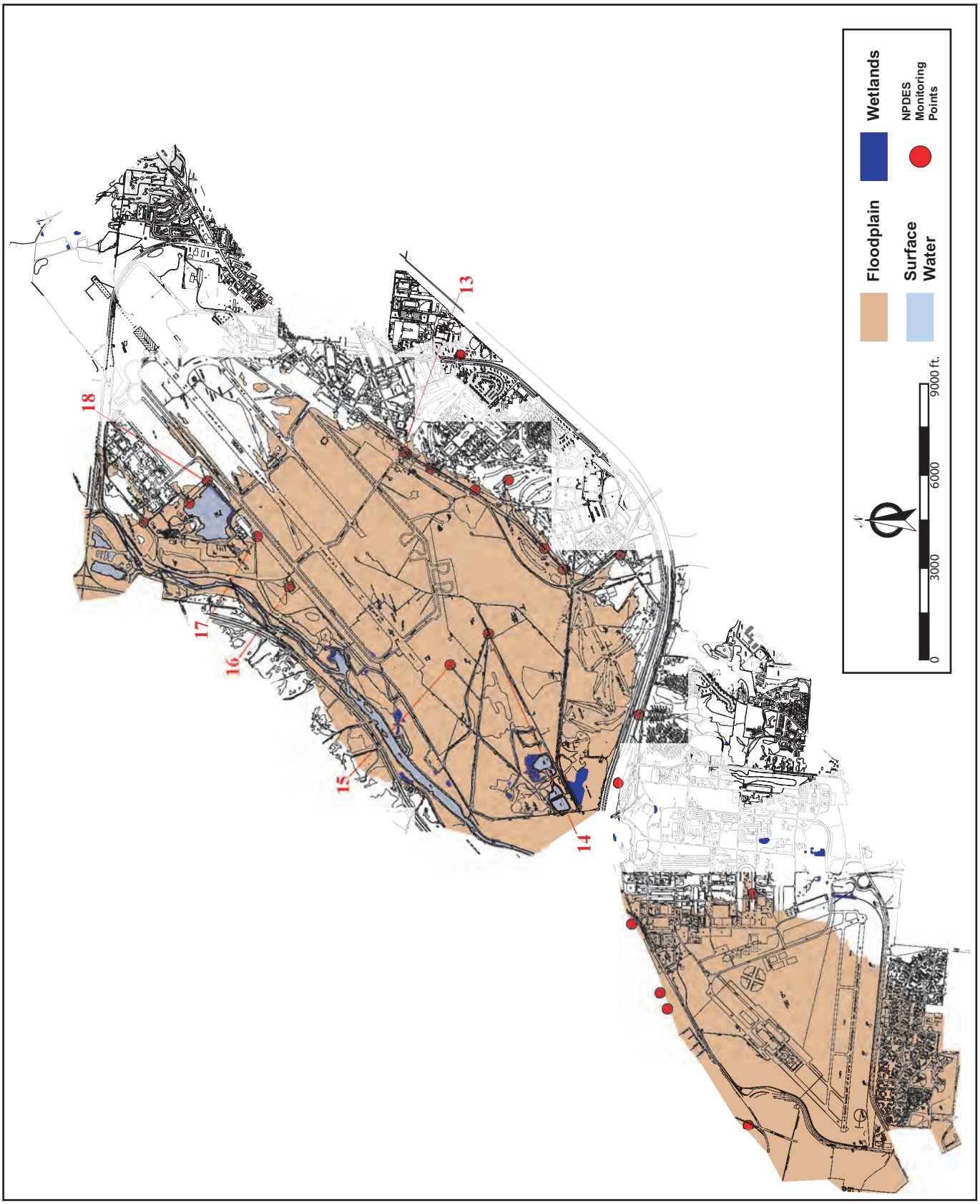

Figure 3-7. Surface Water, 100-Year Floodplain, NPDES Monitoring Points, and Wetlands at Wright-Patterson AFB

3.8 Biological Resources

3.8.1 Definition of Resource

Biological resources include native or naturalized plants and animals, and the habitats, such as wetlands, forests, and grasslands, in which they exist. Sensitive and protected biological resources include plant and animal species listed as threatened or endangered by the USFWS or a state.

Wetlands are an important natural system and habitat because of the diverse biologic and hydrologic functions they perform. These functions include water quality improvement, groundwater recharge and discharge, pollution mitigation, nutrient cycling, wildlife habitat detention, and erosion protection. Wetlands are protected as a subset of the "the waters of the United States" under Section 404 of the CWA. The term "waters of the United States" has a broad meaning under the CWA and incorporates deepwater aquatic habitats and special aquatic habitats (including wetlands). USACE defines wetlands as "those areas that are inundated or saturated with ground or surface water at a frequency and duration sufficient to support, and that under normal circumstances do support, a prevalence of vegetation typically adapted to life in saturated soil conditions. Wetlands generally include swamps, marshes, bogs, and similar areas" (33 CFR Part 328).

Under the ESA (16 U.S.C. 1536), an "endangered species" is defined as any species in danger of extinction throughout all or a large portion of its range. A "threatened species" is defined as any species likely to become an endangered species in the foreseeable future. The USFWS also maintains a list of species considered to be candidates for possible listing under the ESA. Although candidate species receive no statutory protection under the ESA, the USFWS has attempted to advise government agencies, industry, and the public that these species are at risk and might warrant protection under the Act.

3.8.2 Existing Conditions

Vegetation. Natural vegetative communities on Wright-Patterson AFB can be divided into five general categories: forest/woodlands (709 acres), wetlands (23 acres), prairie (109 acres), old fields (388 acres), and waste areas. Waste areas include all areas that are routinely maintained by mowing (e.g., airfields, parks, roadsides, and golf courses) and other developed areas such as parking lots, residential lawns, and other green space between buildings. Wright-Patterson AFB has documented 650 species of vascular plants on Base. Floral surveys were conducted on the Base in July and September 1998, and May 1999 (WPAFB 2001a). Some species occurred in more than one habitat type. Waste areas had the largest number of plant species (296, 46 percent of the species total for

Wright-Patterson AFB). Wetland areas had 95 species, old fields had 168 species, Huffman Prairie had 184 species, and forests had 237 species. A high percentage of nonnative species (28 percent) was encountered. Forests and wetland areas had the lowest percentage of nonnative species (12 percent and 15 percent, respectively). Waste areas had the highest percentage of nonnative species (52 percent). However, the low percentage of nonnative species in the forest was not indicative of forest relatively free of nonnative plants. Two nonnative plants, amur honeysuckle (*Lonicera maackii*) and garlic mustard (*Alliaria petiolata*), dominated forest shrub and herbaceous layers, respectively. All 13 invasive species listed as Targeted Species by the Ohio Department of Natural Resources are present on the Base.

Woodlands. The deciduous forest on Wright-Patterson AFB demonstrates seasonal variation. During winter, the leafless forest is open, and plants are dormant. In spring, new leaves form and most plants flower. During the summer "leaf-out," little light penetrates the canopy to the forest floor. In the autumn, the leaves change color and drop (WPAFB 2001a). The majority of wooded acres on Wright-Patterson AFB are riparian forest within the floodplain of the Mad River (WPAFB 2001a). The eastern deciduous forests of North America can be divided into several distinct associations: the beech-maple, mixed mesophytic, maple-basswood, hemlock-white pine, northern hardwoods, oak-chestnut, oak-hickory, and southern mixed hardwood forests (WPAFB 2001a). Wright-Patterson AFB contains the beech-maple and mixed-mesophytic associations.

The beech-maple forest association is found only on the glaciated land, which includes most of Ohio, northern Indiana, and parts of southern Michigan. This association is best developed on mesic, fairly well-drained sites. Throughout the beech-maple forest ranges, the two dominant tree species are American beech (*Fagus grandifolia*) and sugar maple (*Acer saccharum*). In areas with high soil moisture, like much of Wright-Patterson AFB, associated species like green ash (*Fraxinus pennsylvatica*) and white ash (*F. americana*) are among the dominant tree species.

The mixed-mesophytic forest association is the most diverse of the deciduous forest types. This vegetative association occurs on moist, well-drained sites, and can be found in a portion of eastern Tennessee, eastern Kentucky, much of West Virginia, and southern Ohio. Widespread dominants include American beech, yellow poplar (*Liriodendron tulipifera*), basswood (*Tilia americana*), sugar maple, northern red oak (*Quercus rubra*), and white oak (*Q. alba*).

Forest habitat on the Base is composed of riparian forest and upland forest. Riparian forest is located mainly along the Mad River while the majority of upland forest is found in scattered woodlots away

from the river. Some large forested areas contain inclusions of wetland areas that are considered part of the forest if there is no major change in vegetation. A total of 237 plant species have been identified in forests on Wright-Patterson AFB. The percentage of nonnative species in forest habitat was lowest of any habitat type on the base (13 percent, 30 exotic species). However, the one nonnative species, amur honeysuckle, was the most abundant understory shrub in most forest areas on the Base. Another exotic species, garlic mustard, was typically the most dominant forest herbaceous species.

Dominant trees in the riparian forests include box elder (*Acer negundo*), slippery elm (*Ulmus rubra*), eastern cottonwood (*Populus deltoids*), hackberry (*Celtis occidentalis*), green ash, silver maple (*A. saccharinum*), black maple (*A. nigrum*), black walnut (*Juglans nigra*), black locust (*Robinia psuedoacacia*), honey locust (*Gleditsia triacanthos*), yellow poplar, bitternut hickory (*Carya cordiformis*), redbud (*Cercis canadensis*), and ironwood (*Carpinus caroliniana*). Dominant shrubs include amur honeysuckle, bladdernut (*Staphylea trifolia*), blackhaw (*Viburnum rufidulum*), silky dogwood (*Cornus amomum*), common elderberry (*Sambucus canadensis*), spicebush (*Lindera benzoin*), and sandbar willow (*Salix exigua*). Dominant herbs include lesser celandine (*Ranunculus ficaria*), wingstem (*Actinomeris alternifolia*), tall coneflower (*Rudbeckia laciniata*), poison ivy (*Toxicodendron radicans*), bedstraw (*Galium aparine*), black snakeroot (*Sanicula marilandica*), spotted touch-me-not (*Impatiens pallida*), hog peanut (*Amphicarpa bracteata*), false nettle (*Boehmeria cylindrical*), ground ivy (*Glechoma hederacea*), false mermaid weed (*Floerkea proserpinacoides*), spring beauty (*Claytonia virginica*), sedge (*Carex blanda*), white avens (*Geum canadense*), garlic mustard, and clearweed (*Pilea pumilia*).

Dominant trees in the upland forests include sugar maple, white oak, northern red oak, red maple (*A. rubrum*), shagbark hickory (*C. ovata*), white ash, blue ash (*F. quadrangulata*), slippery elm, redbud, and black locust. Dominant shrubs included amur honeysuckle, gray dogwood (*Cornus racemosa*), and blackhaw. The most abundant herbs were garlic mustard, white avens, wild ginger, poison ivy, midwestern blue heart-leaved aster (*Aster shortii*), white snakeroot (*Eupatorium rugosum*), mayapple (*Podophyllum peltatum*), spring beauty, black raspberry (*Rubus occidentalis*), bedstraw, sweet scent bedstraw (*Galium triflorum*), eastern figwort (*Scrophularia marilandica*), Virginia creeper (*Parthenocissus quinquefolia*), and sedge.

Wright-Patterson AFB forest resources are of limited commercial value and therefore managed for their aesthetic and wildlife habitat value. Maintaining or improving forests for their aesthetic value or habitat value for legally protected species places constraints on the USAF mission. Forest resources

can also conflict with the Wright-Patterson AFB mission by interfacing with flight paths. For flight safety, some areas must be clear of trees (i.e., CZs) and in other areas trees cannot exceed specific heights (e.g., glide and side-slope areas).

Prairie and Old Fields. Prairie habitat is present within Wright-Patterson AFB's Huffman Prairie, which is an open (relatively treeless) community typically dominated by characteristic grasses. Huffman Prairie, covering approximately 109 acres in Area C, is one of the largest tall grass prairie remnants in Ohio. The majority of the vegetation at Huffman Prairie reflects recent land use history. Introduced forage grasses and nonnative forbs are well established. While there are about 125 native plant species in Huffman Prairie, there are also at least half that many nonnative species (WPAFB 2001a). The aggressive nonnative plants contribute to the degraded condition of the prairie. Degraded prairie, evidenced by a higher proportion of nonnative than native plant species, covers approximately 72 acres and high-quality prairie covers roughly 25 acres (WPAFB 2001a). The prairie has at least 36 prairie-indicator species, including the prairie grasses big bluestem (*Andropogon gerardii*), Indian grass (*Sorgastrum nutans*), prairie cordgrass (*Spartina pectinata*), and little bluestem (*Andropogon scoparius*); and prairie forbs such as ox-eye (*Heliopsis helianthoides*), black-eyed Susan (*Rudbeckia hirta*), and gray-headed coneflower (*Ratibida pinnata*) (WPAFB 2001a).

There are three potentially state-threatened plant species that occur in the prairie: false gromwell (*Onosmodium molle*), royal catchfly (*Silene regia*), and tall larkspur (*Delphinium exaltatum*). The royal catchfly and tall larkspur were planted in the prairie as part of a restoration effort.

Most old field habitat is found in Area C near Huffman Prairie. Dominant plants found in old field communities include grasses such as bromegrass (*Bromus* spp.), goldenrod (*Solidago* spp.), ironweed (*Vernonia* spp.), and some woody species. Associated old field vegetation includes forb stands, mixed shrubs, and early successional hardwood species. Some of the old field areas are periodically mowed. Dandelion (*Taraxacum oficinale*), English plantain (*Plantago major*), and common plaintain (*P. lanceolata*) are common in mowed areas (WPAFB 2001a).

Wildlife. Wright-Patterson AFB is home to a diverse assemblage of animals. Many animals are only present at Wright-Patterson AFB for a short period while migrating between winter and summer habitats, while others are year-round residents. Common mammals on Wright-Patterson AFB include white-tailed deer (*Odocoileus virginianus*), raccoon (*Procyon lotor*), Virginia opossum (*Didelphis virginiana*), beaver (*Castor canadensis*), groundhog (*Marmota monax*), eastern fox squirrel (*Sciurus carolinensis*), eastern chipmunk (*Tamias striatus*), and deer mouse (*Peromyscus mamniculata*).

Common birds on Base include European starling (*Sturnus vulgarus*), eastern meadowlark (*Sturnella magna*), barn swallow (*Hirundo rustica*), savannah sparrow (*Passerculus sandwichensis*), red-winged blackbird (*Angelaius phoeniceus*), Canada goose (*Branta canadensis*), red-tailed hawk (*Buteo jamaicensis*), horned lark (*Eremophila alpestris*), American robin (*Turus migratorius*), turkey vulture (*Cathartes aura*), mourning dove (*Zenaida macroura*), killdeer (*Charadrius vociferous*), American crow (*Corvus brachyrhynchos*), and mallard (*Anas playtrhynchos*).

Threatened and Endangered Species. The ESA establishes a Federal program to conserve, protect, and restore threatened and endangered plants and animals and their habitats. The ESA specifically charges Federal agencies with the responsibility of using their authority to conserve threatened and endangered species. All Federal agencies must ensure any action they authorize, fund, or carry out is not likely to jeopardize the continued existence of a threatened or endangered species or result in the destruction of critical habitat for these species, unless the agency has been granted an exemption. The Secretary of the Interior, using the best available scientific data, determines which species are officially threatened or endangered. States may also have their own lists of threatened and endangered species. Currently, there are 12 Federal- and state-listed threatened and endangered species known to occur on Wright-Patterson AFB (see Table 3-7).

Wright-Patterson AFB conducted a base-wide mist net survey for the Indiana bat (*Myotis sodalis*). Twelve sites were surveyed from July 24 to August 1, 2000. Of the 33 bats captured, three bat species were recovered: Indiana bats, big brown bats (*Eptesicus fuscus*), and red bats (*Lasiurus borealis*). There were two individual Indiana bats, a juvenile female and a post-lactating adult female.

Summer habitat requirements for the Indiana bat are not well defined, but the following are thought to be of importance (Knapp 2004):

- Dead or live trees and snags with peeling or exfoliating bark, split tree trunk and/or branches, or cavities, which might be used as maternity roost areas.
- Live trees (such as shagbark hickory) with exfoliating bark.
- Stream corridors, riparian areas, and upland woodlots (which provide forage sites).

Wetlands. EO 11990, *Protection of Wetlands*, May 24, 1977, directs Federal agencies to consider alternatives to avoid adverse effects on and incompatible development in wetlands. Federal agencies are directed to avoid new construction in wetlands, unless the agency finds there is no practicable alternative to construction in the wetland, and the proposed construction incorporates all possible measures to limit harm to the wetland.

Table 3-7. Rare Species Known to Occur on Wright-Patterson AFB

Common Name	Scientific Name	Federal Status	State of Ohio Status
MAMMALS			
Indiana bat [a, b, 1]	*Myotis sodalis*	E	E
BIRDS			
Upland sandpiper [a, b]	*Bartramia longicauda*	NL	T
Sedge wren [a, b]	*Cistothorus platensis*	NL	SC
Peregrine falcon [a]	*Falco peregrinus anatum*	M	E
Bald eagle [a, 1]	*Haliaeetus leucocephalus*	T	E
Osprey [a]	*Pandion haliaetus*	NL	E
King rail [a]	*Rallus elegans*	NL	E
Common tern [a]	*Sterna hirundo*	M	E
REPTILES			
Eastern massasauga rattlesnake [a, b, 1]	*Sistrurus catenatus*	C	E
MUSSELS			
Clubshell (subfossil) [a, 1]	*Pleurobema clava*	E	E
ARTHROPODS			
Blazing star stem borer, Beer's noctuid [b, 1]	*Papaipema beeriana*	NL	E
PLANTS			
Midland sedge [b]	*Carex mesochorea*	NL	T
Fringe-tree [a]	*Chionanthus virginicus*	NL	T
Tall larkspur [a]	*Delphinium exaltatum*	NL	P
Butternut [b]	*Juglans cinerea*	NL	P
Green Plains ladies'-tresses [a, b]	*Myriophyllum verticillatum*	NL	P
False gromwell [a]	*Onosmodium molle*	NL	P
Royal catchfly [a]	*Silene regia*	NL	P
Pigeon Grape [b]	*Vitis cinerea*	NL	P

Sources: [a]WPAFB 2001a and [b]Sanders 2004

Notes:

[1] Species is included in Wright-Patterson AFB's Endangered Species Management Plan

E: Endangered

NL: Not Listed

M: Monitored Species of Concern

T: Threatened

C: Candidate

SC: Ohio Species of Special Concern

P: Potentially Threatened

The CWA sets the basic structure for regulating discharges of pollutants to U.S. waters. Section 404 of the CWA establishes a Federal program to regulate the discharge of dredged and fill material into waters of the United States, including wetlands. The National Wetlands Inventory (NWI) (a department within USWFS), USEPA, and the NRCS help in identifying wetlands. USACE is responsible for making jurisdictional determinations and regulating wetlands under Section 404 of the CWA. USACE also makes jurisdictional determinations under Section 10 of the Rivers and Harbors Act of 1899. NRCS has developed procedures for identifying wetlands for compliance with the Food Security Act of 1985 and the NWI has developed a classification system for identifying wetlands. Through the NWI, the USFWS is the principal Federal agency that provides information to the public on the extent and status of wetlands.

Wright-Patterson AFB has 22.2 acres of wetlands in Areas B and C (WPAFB 2001a). These wetlands are primarily emergent and palustrine-forested wetlands (WPAFB 2001a). In addition, approximately 25 acres of marginal wetlands are present in Areas B and C. Marginal wetlands have only some of the diagnostic characteristics of true wetlands (i.e., hydric soils, obligate wetland plant species, drainage patterns, seasonally inundated). No wetlands were identified in Area A. Figure 3-7 indicates locations of wetlands in Areas B and C.

The CWA requires the protection of wetlands, which imposes a constraint to the USAF mission. To comply with CWA and State of Ohio wetland protection laws, Wright-Patterson AFB avoids, when possible, impacts on wetlands. Jurisdictional wetland identification is critical to identifying wetland constraints to the USAF mission.

3.9 Cultural Resources

3.9.1 Definition of the Resource

Cultural resources are defined by the NHPA as prehistoric and historic sites, structures, districts, or any other physical evidence of human activity considered important to a culture, a subculture, or a community for scientific, traditional, religious, or any other reason. Depending on the condition and historic use, such resources could provide insight into living conditions in previous civilizations and/or might retain cultural and religious significance to modern groups.

Several Federal laws and regulations govern protection of cultural resources, including the NHPA (1966), the Archaeological and Historic Preservation Act (1974), the American Indian Religious Freedom Act (1978), the Archaeological Resources Protection Act (1979), and the Native American Graves Protection and Repatriation Act (1990).

Typically, cultural resources are subdivided into archaeological resources (prehistoric or historic sites where human activity has left physical evidence of that activity but no structures remain standing) or architectural resources (buildings or other structures or groups of structures, or designed landscapes that are of historic or aesthetic significance). Archaeological resources comprise areas where human activity has measurably altered the earth or deposits of physical remains are found (e.g., arrowheads and bottles).

Architectural resources include standing buildings, bridges, dams, and other structures of historic or aesthetic significance. Generally, architectural resources must be more than 50 years old to be considered for the NRHP. More recent structures, such as Cold War-era resources, might warrant protection if they have the potential to gain significance in the future.

Traditional cultural properties or sacred sites can include archaeological resources, structures, neighborhoods, prominent topographic features, habitat, plants, animals, and minerals that Native Americans or other groups consider essential for the preservation of traditional culture.

The EA process and the consultation process prescribed in Section 106 of the NHPA requires an assessment of the potential impact of an undertaking on historic properties that are within the proposed project's Area of Potential Effect (APE), which is defined as the geographic area(s) "within which an undertaking may directly or indirectly cause alterations in the character or use of historic properties, if any such properties exist." In accordance with EO 12372, *Intergovernmental Review of Federal Programs*, determinations regarding the potential effects of an undertaking on historic properties are presented to the SHPO.

3.9.2 Existing Conditions

A total of 2,178 acres (27 percent) of the Base has been surveyed for prehistoric archaeological resources and 17 sites were identified. Five of the sites, all campsites, are considered potentially eligible for the NRHP. In addition, two mound sites (33GR30 and 33GR31) are listed on the NRHP (WPAFB 1999b). None of the sites are within the APE of the Proposed Action.

Another 6,000 acres (61 percent) have been excluded from survey for prehistoric archaeological resources due to previous high levels of disturbance or because they are off limits (and disturbed) (WPAFB 1999b). The APE for the Proposed Action is considered previously disturbed and the potential for the discovery of archaeological resources during construction is low.

Based on map studies, Wright-Patterson AFB initially identified 115 historical archaeological resources. Further investigation indicated that 8 are eligible for the NRHP, 9 are ineligible, 16 are potentially eligible, 68 are potentially ineligible, and 15 are not on the Base or researchers were unable to locate them (WPAFB 1999b). No eligible sites are within the APE for the Proposed Action. The likelihood of identifying new historic archaeological sites on the Base is low.

Through historic structure inventories, the Base has been divided into 11 context areas based on the chronological growth of Wright-Patterson AFB and the infrastructural growth to support evolving missions. The APE for Project 8 in the Proposed Action is located in an area designated Fairfield Air Depot (associated with the air depot built during World War I and a portion of Wilbur Wright Field). Projects 1 through 7 and 9 through 10 are located in the West Ramp Area of Area C (WPAFB 1999b).

The Fairfield Air Depot area contains one of four historic (proposed) districts at Wright-Patterson AFB. The Fairfield Air Depot Historic District, which covers 155 acres southwest of the APE, contains 29 contributing buildings and one contributing structure. None of the elements of the district are in the APE. Building 152, which would be modified under the Proposed Action, is independently eligible for the NRHP (WPAFB 1999b). The building, a hangar, was constructed in 1953, and its eligibility lies in its role as part of the first line of air defenses of Cold War America. The building has been subjected to modification since it was built, but its exterior is relatively unchanged (except for the installation of new windows and the construction of small entrance vestibules on the east and west elevations) (WPAFB 1998).

All the structures associated with the West Ramp Area were built between 1958 and 1960. Building 4004, the Operations Building and Alert Scramble Facility is considered NRHP eligible, but it is outside the APE for the Proposed Action (WPAFB 1999b).

Thirteen historic landscapes have been identified at WPAFB. One, the Huffman Prairie Flying Field, is listed on the NRHP. Three are historic districts. Eight are considered potentially eligible for the NRHP, and one is potentially ineligible (WPAFB 1999b). None of the historic landscapes are within the APE for the Proposed Action.

3.10 Socioeconomics and Environmental Justice

3.10.1 Definition of the Resource

Socioeconomics are defined as the basic attributes and resources associated with the human environment, particularly population and economic activity. Regional birth and death rates and immigration and emigration affect population levels. Economic activity typically encompasses employment, personal income, and industrial or commercial growth. Changes in these two fundamental socioeconomic indicators might be accompanied by changes in other components, such as housing availability and the provision of public services. Socioeconomic data at county, state, and national levels permit characterization of baseline conditions in the context of regional, state, and national trends.

Data in three areas provide key insights into socioeconomic conditions that might be affected by a proposed action. Data on employment could identify gross numbers of employees, employment by industry or trade, and unemployment trends. Data on personal income in a region could be used to compare the "before" and "after" effects of any jobs created or lost as a result of a proposed action. Data on industrial or commercial growth or growth in other sectors provides baseline and trend line information about the economic health of a region.

In appropriate cases, data on an installation's expenditures in the regional economy help to identify the relative importance of an installation in terms of its purchasing power and jobs base. Demographics identify the population levels and changes to population levels of a region. Demographics data might also be obtained to identify, as appropriate to evaluation of a proposed action, its characteristics in terms of race, ethnicity, poverty status, educational attainment level, and other broad indicators.

On February 11, 1994, the President issued EO 12898, *Federal Actions to Address Environmental Justice in Minority Populations and Low-Income Populations*. This EO requires that Federal agencies' actions substantially affecting human health or the environment do not exclude persons; deny persons benefits; or subject persons to discrimination because of their race, color, or national origin. The essential purpose of the EO is to ensure the fair treatment and meaningful involvement of all people regardless of race, color, national origin, or income with respect to the development, implementation, and enforcement of environmental laws, regulations, and policies. Fair treatment means that no groups of people, including racial, ethnic, or socioeconomic groups, should bear a disproportionate share of the adverse environmental consequences resulting from industrial,

municipal, and commercial operations or the execution of Federal, state, tribal, and local programs and policies. Consideration of environmental justice concerns includes race, ethnicity, and the poverty status of populations in the vicinity of where a proposed action would occur. Such information aids in evaluating whether a proposed action would render vulnerable any of the groups targeted for protection in the EO.

Socioeconomic data shown in this section are presented at county, state, and U.S. levels to characterize baseline socioeconomic conditions in the context of regional, state, and national trends. Data have been collected from previously published documents issued by Federal, state, and local agencies and from state and national databases (e.g., U.S. Bureau of Economic Analysis' Regional Economic Information System).

On April 21, 1997, the President issued EO 13045, *Protection of Children from Environmental Health Risks and Safety Risks*. This EO requires Federal agencies, to the extent permitted by law and mission, to identify and assess environmental health and safety risks that might disproportionately affect children. The EO further requires Federal agencies to ensure that their policies, programs, activities, and standards address these disproportionate risks. The order defines environmental health and safety risks as "risks to health or to safety that are attributable to products or substances that the child is likely to come in contact with or ingest (such as the air we breathe, the food we eat, the water we drink and use for recreation, the soil we live on, and the products we use or are exposed to)." Such information aids in evaluating whether a proposed action would render vulnerable children targeted for protection in the EO.

3.10.2 Existing Conditions

Social and Economic Condition. Wright-Patterson AFB is located 10 miles outside of Dayton, Ohio. The city of Dayton has a population of 166,179; the Dayton-Springfield, Ohio Metropolitan Statistical Area (MSA) has a population of 950,558 (Bureau of Census 2000a). The MSA is defined by the U.S. Census Bureau as a core area with a large population nucleus (at least 50,000) and the adjoining communities that have a high degree of economic and social integration within that core (Bureau of Census 2000b). The Dayton-Springfield MSA includes the counties of Greene, Montgomery, Miami, and Clark. Between 1999 and 2000, the populations of Dayton and the Dayton-Springfield MSA decreased by approximately 9.0 percent and 1.0 percent, respectively (Bureau of Census 1990, 2000a). The decreases in population do not correspond with the statewide population increase of 4.0 percent over the same time period. For the purposes of this EA, the MSA is considered the ROI around Wright-Patterson AFB (Bureau of Census 2000a).

Some of the key industries in the Dayton, Ohio, economy include services, trade (wholesale and retail), government, and manufacturing. In FY 02 the finance and insurance industries increased by 2.2 percent and the jobs provided by the government increased 1.7 percent (DACC 2003).

Table 3-8 lists the industry of employment for residents around Wright-Patterson AFB, the Dayton-Springfield MSA, and the state of Ohio in 2000. A large portion of residents in the Dayton-Springfield MSA are employed in education, health and social services, and public education or manufacturing; a lower percentage are employed in agriculture, forestry, fishing and hunting, and mining.

Table 3-8. Employment of Residents in Dayton-Springfield MSA, Greene County, and the State of Ohio

Employment by Industry	Dayton–Springfield MSA	Greene County	State of Ohio
Percent of Employed Persons in Armed Forces	0.7%	2.2%	0.1%
Industry of Civilian Labor Force			
Agriculture, forestry, fishing and hunting, and mining	0.5%	0.7%	1.1%
Construction	5.4%	5.4%	6.0%
Manufacturing	19.1%	13.8%	20.0%
Wholesale trade	3.2%	2.6%	3.6%
Retail trade	12.0%	12.3%	11.9%
Transportation and warehousing, and utilities	4.8%	3.9%	4.9%
Information	2.3%	2.3%	2.4%
Finance, insurance, real estate, and rental and leasing	5.0%	4.5%	6.3%
Professional, scientific, management, administrative, and waste management services	9.0%	9.6%	8.0%
Education, health and social services	20.8%	23.8%	19.7%
Arts, entertainment, recreation, accommodation, and food services	7.5%	7.9%	7.5%
Other services (except public administration)	4.4%	4.2%	4.5%
Public administration	5.9%	8.9%	4.1%

Source: Bureau of Census 2000a

The unemployment rate for the Dayton-Springfield MSA in November 2003 was 5.2 percent, slightly lower than the statewide average of 5.3 percent (DACC 2004). The 2000 unemployment rate in the MSA around Wright-Patterson AFB and within Greene County was 3.3 percent, slightly higher than the state average of 3.2 percent. Residents living in Greene County have a lower per capita income and median household income in comparison to the MSA and the state of Ohio (Bureau of Census 2000a). The residents of Greene County also have a higher percent of persons living below the poverty level (see Figure 3-8). The difference between the income and poverty levels are not considered to be substantially different from the MSA, countywide, or statewide averages.

The percent of residents who have obtained a high school diploma is substantially the same around Wright-Patterson AFB, countywide, and statewide (see Figure 3-9). However, a smaller percentage of residents in the MSA achieved a college education (22.4 percent) in comparison to Greene County (22.7 percent) and statewide (23.2 percent) percentages.

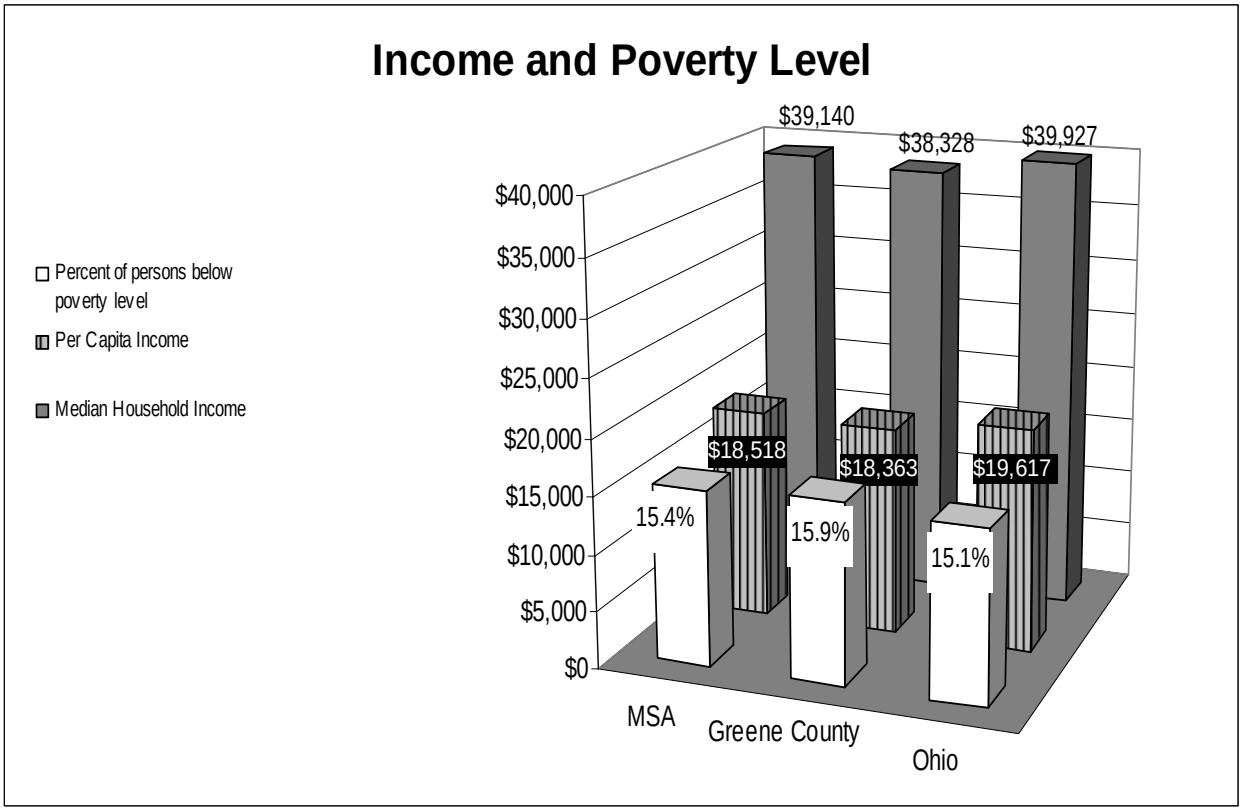

Figure 3-8. Income and Poverty Level of Residents in Dayton–Springfield MSA, Greene County, and the State of Ohio

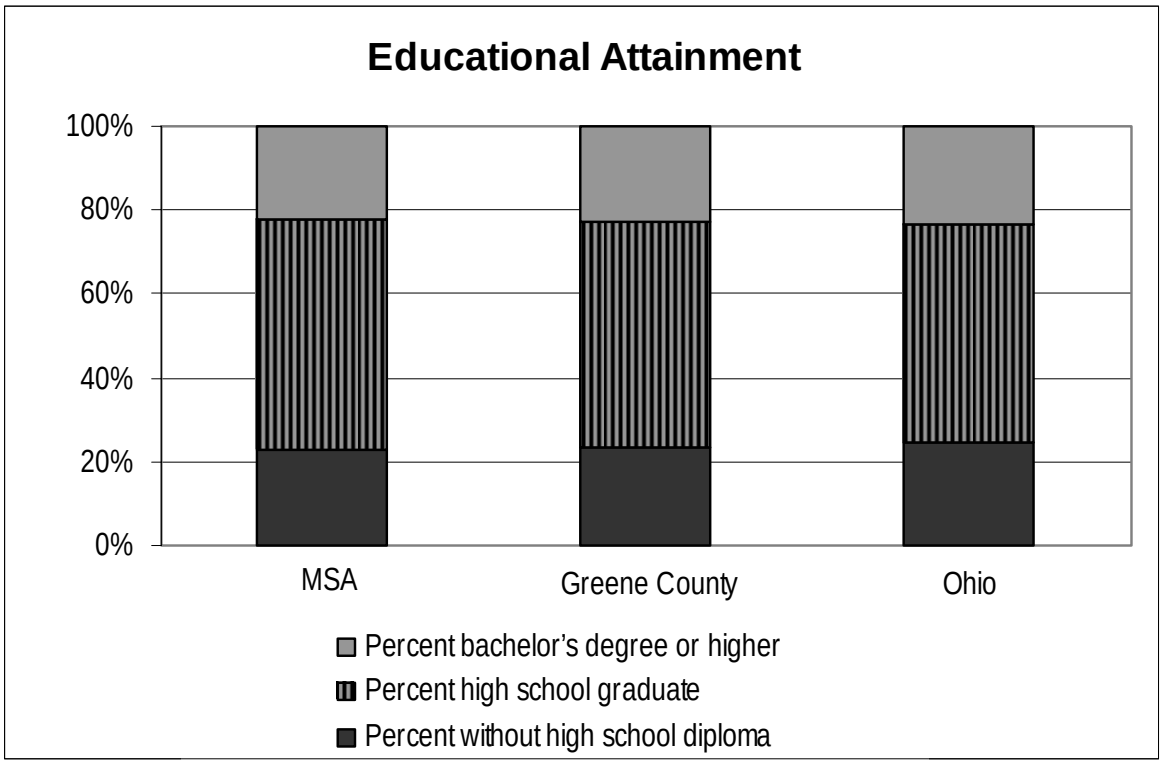

Figure 3-9. Educational Attainment of the Residents in Dayton-Springfield MSA, Greene County, and the State of Ohio

Environmental Justice. For the purposes of analysis in this EA, residents living within the MSA around Wright-Patterson AFB were evaluated. Census Bureau Tract 2001.02, which is northwest of Wright-Patterson AFB, was found to have a somewhat higher portion of minority populations (25 percent) than adjoining areas (average of 15 percent) (see Figure 3-10). Census Bureau Tract 2007, which is located southeast of the Base, has a minority population that is relatively equal to surrounding areas (Bureau of Census 2000a). Residents of Census Bureau Tract 2001.02 were also found to have a lower per capita income ($13,339), a higher unemployment rate (9.4 percent), a higher portion of residents living below the poverty level (38.5 percent), and a higher population growth rate between 1990 and 2000 (31 percent) in comparison with residents in adjoining areas (Bureau of Census 1990, 2000a). Residents of Census Bureau Tract 2007 were also found to have a lower per capita income ($13,295), a slightly higher unemployment rate (3.6 percent), a higher portion of residents living below the poverty level (23.3 percent), and a higher population growth rate between 1990 and 2000 (24 percent) in comparison to residents in adjoining areas (Bureau of Census 1990, 2000a). For the purpose of this analysis, residents living within Census Bureau Tract 2001.02 and 2007 are further evaluated to determine if a disproportionate level of impact could occur.

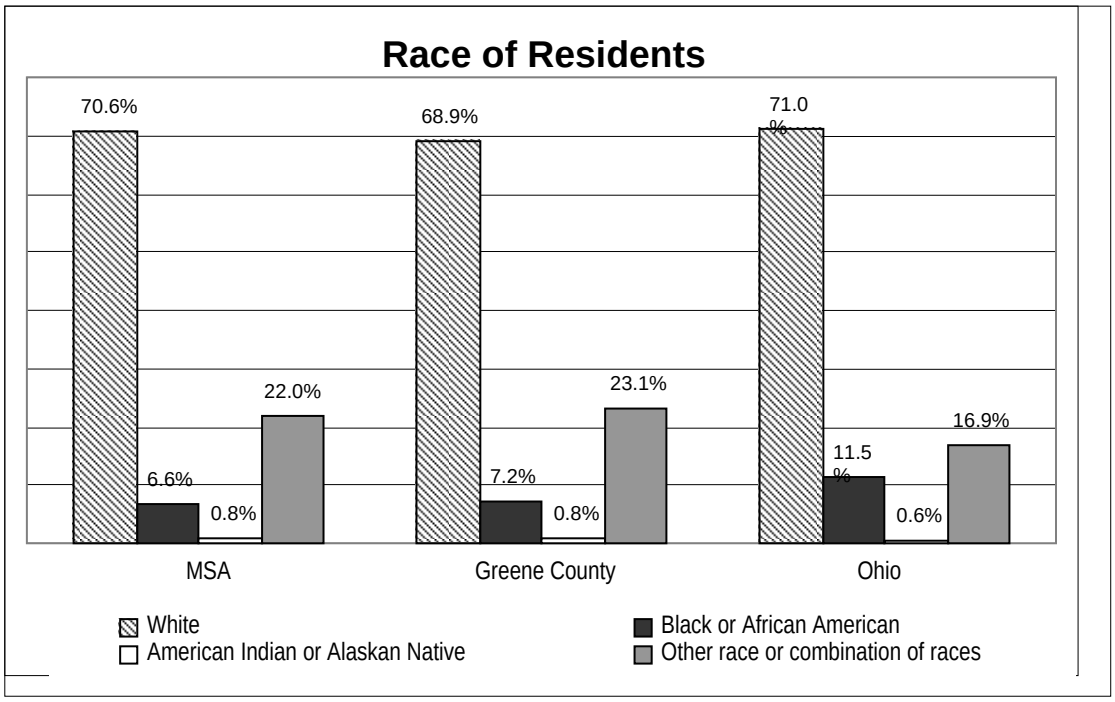

Figure 3-10. Race of Residents in Dayton-Springfield MSA, Greene County, and the State of Ohio

3.11 Infrastructure

3.11.1 Definition of the Resource

Infrastructure consists of the systems and physical structures that enable a population in a specified area to function. Infrastructure is wholly human-made, with a high correlation between the type and extent of infrastructure and the degree to which an area is characterized as "urban" or developed. The availability of infrastructure and its capacity to support growth are generally regarded as essential to economic growth of an area. The infrastructure information contained in this section was obtained from the Wright-Patterson AFB General Plan (WPAFB 2001b) and provides a brief overview of each infrastructure component and comments on its existing general condition. The infrastructure components to be discussed in this section include transportation systems, utilities (electrical power, natural gas, liquid fuel, and water supply), pollution prevention, solid waste, sanitary and wastewater systems, heating and cooling, communications, and airfield pavement.

Solid waste management primarily concerns itself with the availability of landfills to support a population's residential, commercial, and industrial needs. Alternative means of waste disposal might involve waste-to-energy programs or incineration. In some localities, landfills are designed specifically for, and are limited to, disposal of construction and demolition debris. Recycling

programs for various waste categories (e.g., glass, metals, and papers) reduce reliance on landfills for disposal.

3.11.2 Existing Conditions

Transportation Systems. The off-Base transportation system at Wright-Patterson AFB consists of direct connections to city streets in the bordering communities of Fairborn, Riverside, and Huber Heights, Ohio (WPAFB 2001b). Streets that border Wright-Patterson AFB to the north are Springfield Pike and Kauffman Avenue, to the east is National Road, and Colonel Glenn Highway/Airway Road is to the south. Springfield Pike is accessible via the Main Gate (1B) and National Road is accessed via Gate 19B during peak hours. Gate 22B provides direct access to I-675 from Colonel Glenn Highway (WPAFB 2001b).

State highways provide direct access to Wright-Patterson AFB. SR-444 bisects the Base creating a barrier between Wright Field and Patterson Field and provides direct access to Kauffman Avenue and National Road (WPAFB 2001b). SR-844 provides a route from Gate 15A to I-675, which is located east of the Base. I-675 provides direct access to I-70, which is approximately 9 miles to the north; U.S. 35, which is approximately 5 miles to the south; and I-75, which is approximately 15 miles to the southwest (WPAFB 2001b). SR-235 provides access from Gate 26C to SR-4 and I-70 (WPAFB 2001b).

Electrical Power. Dayton Power & Light (DP&L) provides Wright-Patterson AFB with electrical power (WPAFB 2001b). The Base receives power via two substations, which is delivered by the 523 miles of primary electrical lines on Base. These aboveground and underground transmission lines are owned by Wright-Patterson AFB (WPAFB 2001b). DP&L's Airway substation is located on SR-844 at I-675 and delivers 69 kilovolts of power to the switching station located on Kauffman Avenue (WPAFB 2001b). The second substation is Substation J, which is limited to 30 Megavolt-amperes, one-half of the total electrical power requirements of the Base (WPAFB 2001b).

There are eight substations on Base, which deliver power at 15 kilovolts. The electrical distribution system on Base is designed to meet the needs of a much larger base population so the demands of service are within the system's capacity (WPAFB 2001b). The overall condition of the system is adequate in providing the power to the current Base population. There are plans to repair or replace light poles, circuits, circuit breakers, and distribution lines throughout the Base (WPAFB 2001b).

Natural Gas. The natural gas at Wright-Patterson AFB is supplied by Vectren. The on-Base natural gas system, which is owned by Wright-Patterson AFB, contains 131,000 linear feet of underground piping and 11 distribution subsystems (WPAFB 2001b). Vectren owns a distribution line that goes past the Wright Memorial area. The natural gas system is the principal heating option for housing areas and outlying areas of the Base. It feeds some individual buildings and the three satellite heating plants: Buildings 581, 849, and 4019 (WPAFB 2001b).

Liquid Fuel. The liquid fuel system at Wright-Patterson AFB is delivered by commercial pipeline and commercial tank truck. The system consists of approximately 120 underground storage tanks (USTs) and 250 aboveground storage tanks (ASTs). Eighty percent of the storage capacity on Base is for Jet Propellant-8 (JP-8), which is supplied directly to the Base via truck from British Petroleum (WPAFB 2001b). The JP-8 tank farm is comprised of ten 420,000-gallon ASTs and one 840,000-gallon AST. There are eight 50,000-gallon USTs, one 15,000-gallon motor gas tank, and one 220,000-gallon diesel truck that feed the fuel hydrant system on the flightline (WPAFB 2001b).

Water Supply. The water supply and distribution system at Wright-Patterson AFB consists of three Base-owned and -operated water collection, treatment, storage, and distribution systems (WPAFB 2001b). One system services Wright Field and Woodland Hills, a second system services Area A and Patterson Field, and the third system provides water for the Marksmanship Facility. The only portion of the Base that does not use the Wright-Patterson AFB water distribution system is the Page Manor housing area. Page Manor receives water from the Montgomery County Sanitary Sewer District (WPAFB 2001b).

Pollution Prevention. AFI 32-7080, *Pollution Prevention Program*, implements the regulatory mandates in the Emergency Planning and Community Right-to-Know Act, Pollution Prevention Act of 1990; EO 12856, *Federal Compliance with Right-to-Know Laws and Pollution Prevention Requirements*; EO 12873, *Federal Acquisition, Recycling, and Waste Prevention*; and EO 12902, *Energy Efficiency and Water Conservation at Federal Facilities.* AFI 32-7080 prescribes the establishment of Pollution Prevention Management Plans. The 88 ABW fulfills this requirement with the following plans (WPAFB 2001b):

- Integrated Solid Waste Management Plan
- Storm Water Pollution Prevention Plan
- Hazardous Waste Management Plan
- Hazardous Material Emergency Planning and Response Plan
- The Spill Prevention Control and Countermeasure Plan (88 ABW/EM 2003)

These plans ensure that Wright-Patterson AFB maintains a waste reduction program and meets the requirements of the CWA; NPDES permit program; and Federal, state, and local requirements for spill prevention control and countermeasures.

Solid Waste. Municipal solid waste (MSW) at Wright-Patterson AFB is managed in accordance with the guidelines specified in AFI 32-7042, *Solid and Hazardous Waste Compliance*. This AFI incorporates by reference the requirements of Subtitle D, 40 CFR 240 through 244, 257, and 258, and other applicable Federal regulations, AFIs, and DOD Directives. In general, AFI 32-7042 establishes the requirement for installations to have a solid waste management program that incorporates the following: a solid waste management plan; procedures for handling, storage, collection, and disposal of solid waste; record-keeping and reporting; and pollution prevention.

Wright-Patterson AFB operates a Qualified Recycling Program that is run by 88 ABW/EMV. The recycling center is located in Building 293 on Patterson Field. The recycling program includes aluminum, glass, paper, plastics, oil, and ferrous and nonferrous materials (WPAFB 2001b).

Wright-Patterson AFB has a contract for solid waste pick-up and disposal of all refuse on the Base, with Koogler (owned by Waste Management, Inc.) (WPAFB 2001b). The contractor removes refuse from military family housing and industrial areas on the Base.

Sanitary Sewer and Wastewater Systems. The sanitary sewer collection system at Wright-Patterson AFB is owned by the Base and consists of 43 miles of pipelines. The wastewater produced on the north side of Patterson Field is discharged to the Fairborn treatment plant, northwest of the Base. The wastewater produced on the remainder of Patterson Field, Wright Field, and Page Manor is served by the Dayton treatment system (WPAFB 2001b). The 445 AW discharges approximately 4,000 gallons per year (40 percent of deicing fluid used) of propylene glycol to the Fairborn wastewater treatment plant.

Wright-Patterson AFB produces an average of 4.5 million gallons per day of sewage. There is a serious problem on Base with storm water infiltration caused by roof drain cross-connections (WPAFB 2001b). The overall condition of the system is adequate in the collection of wastewater. The current system is designed to accommodate a Base population that is approximately 50 percent larger (WPAFB 2001b).

Heating and Cooling. Wright-Patterson AFB is heated with six coal- and gas-fired central heating plants. These plants are located throughout the Base and provide approximately 84 percent of the

annual heating requirements for Wright-Patterson AFB (WPAFB 2001b). The two largest central heating plants are in Building 1240, which serves Patterson Field and Kittyhawk Community Center; and Building 770, which serves Wright Field (WPAFB 2001b). There are also four satellite heating plants that serve smaller areas on the Base. These plants operate on natural gas and provide 4 percent of the Base's overall heating needs. The remaining 16 percent of the Base's overall heating is met by natural gas furnaces in individual buildings (WPAFB 2001b).

Communications. The communications system at Wright-Patterson AFB provides support to the 445 AW and its associate units. The communications system consists of telephone, local computer systems, long-haul communications, and land mobile radio systems (WPAFB 2001b). There are 106 miles of communication cable ducts on Base (WPAFB 2001b).

Wright-Patterson AFB's communications and information utility infrastructure is in good condition (WPAFB 2001b). There are improvements planned for the Base that would enable it to meet any known future communication requirements (WPAFB 2001b).

Airfield Pavement. The airfield pavement system at Patterson Field includes an extensive system of taxiways and two parking aprons: the east and west ramps (WPAFB 2001b). The west ramp provides aircraft parking for C-141 aircraft associated with the 445 AW. The 47th Airlift Wing uses the east ramp for aircraft operations parking for a small fleet of passenger aircraft (WPAFB 2001b).

3.12 Hazardous Materials and Wastes

3.12.1 Definition of the Resource

AFPD 32-70, *Environmental Quality*, establishes the policy that the USAF is committed to

- Cleaning up environmental damage resulting from its past activities
- Meeting all environmental standards applicable to its present operations
- Planning its future activities to minimize environmental impacts
- Managing responsibly the irreplaceable natural and cultural resources it holds in public trust
- Eliminating pollution from its activities wherever possible

Hazardous material is defined as any substance with physical properties of ignitability, corrosivity, reactivity, or toxicity that might cause an increase in mortality, serious irreversible illness, and incapacitating reversible illness, or that might pose a substantial threat to human health or the environment. Hazardous waste is defined as any solid, liquid, contained gaseous, or semisolid waste;

or any combination of wastes that pose a substantial present or potential hazard to human health or the environment.

Evaluation of hazardous materials and wastes focuses on USTs and ASTs and the storage, transport, and use of pesticides and herbicides, fuels, and petroleum, oils, and lubricants (POL). Evaluation might also extend to generation, storage, transportation, and disposal of hazardous wastes when such activity occurs at or near the project site of a proposed action. In addition to being a threat to humans, the improper release of hazardous materials and wastes can threaten the health and well-being of wildlife species, botanical habitats, soil systems, and water resources. In the event of release of hazardous materials or wastes, the extent of contamination varies based on type of soil, topography, and water resources.

Special hazards are those substances that might pose a risk to human health, but are not regulated as contaminants under the hazardous waste statutes. Included in this category are asbestos-containing materials (ACM), radon, lead-based paint (LBP), polychlorinated biphenyls, and unexploded ordnance. The presence of special hazards or controls over them might affect, or be affected by, a proposed action. Information on special hazards describing their locations, quantities, and condition assists in determining the significance of a proposed action.

The Comprehensive Environmental Response, Compensation, and Liability Act, as amended by the Superfund Amendments and Reauthorization Act (SARA) and the Toxic Substances Control Act, define hazardous materials. The Solid Waste Disposal Act as amended by the Resource Conservation and Recovery Act (RCRA), which was further amended by the Hazardous and Solid Waste Amendments, defines hazardous wastes. In general, both hazardous materials and wastes include substances that, because of their quantity, concentration, physical, chemical, or infectious characteristics, might present substantial danger to public health or welfare or the environment when released or otherwise improperly managed.

Through its Environmental Restoration Program (ERP), DOD evaluates and cleans up sites where hazardous wastes have been spilled or released to the environment. The ERP provides a uniform, thorough methodology to evaluate past disposal sites, to control the migration of contaminants, to minimize potential hazards to human health and the environment, and to clean up contamination. Description of ERP activities provides a useful gauge of the condition of soils, water resources, and other resources that might be affected by contaminants. It also aids in identification of properties and

their usefulness for given purposes (e.g., activities dependent on groundwater usage might be foreclosed where a groundwater contaminant plume remains to complete remediation).

3.12.2 Existing Conditions

Hazardous Materials. AFI 32-7086, *Hazardous Materials Management*, establishes procedures and standards that govern management of hazardous materials throughout the USAF. It applies to all USAF personnel who authorize, procure, issue, use, or dispose of hazardous materials, and to those who manage, monitor, or track any of those activities. A privately contracted hazardous material pharmacy (HAZMART) is located in Building 89. The HAZMART ensures that only the smallest quantities of hazardous materials necessary to accomplish the mission are purchased and used (WPAFB 2001b).

Hazardous and toxic material procurements at Wright-Patterson AFB are approved and tracked by the Bioenvironmental Engineering Office at Wright-Patterson AFB. The Environmental Management Office at Wright-Patterson AFB supports and monitors environmental permits, hazardous material and hazardous waste storage, spill prevention and response, and participation on the Base Environmental Protection Committee.

The 445 AW uses a propylene glycol-based deicing fluid for aircraft deicing operations. Propylene glycol is a colorless, odorless, water-soluble liquid considered safe for use in commercial formulations of foods, drugs, and cosmetics (HHS 1997). Propylene glycol is used widespread because of its low toxicity; only very high doses result in adverse health effects (HHS 1997). However, propylene glycol requires oxygen for breakdown, which can deplete surface waters of dissolved oxygen, resulting in oxygen impairments.

According to a preliminary report, the 445 AW used 10,000 gallons per year of pure deicing fluid (before dilution) for 16 PAA C-141C aircraft over the last 3 years (Shaw Environmental 2004). The propylene glycol is diluted to 60 percent propylene glycol, 40 percent hot water. The 445 AW currently captures about 40 percent of the deicing fluid using a mobile vacuum unit (Shaw Environmental 2004). Aircraft deicing also occurs on C-21 and transient aircraft (approximately 2,200 gallons per year of propylene glycol) and one 747-sized airplane on the East Ramp (approximately 1,100 gallons per year of propylene glycol); no deicing fluid is currently recovered from these deicing operations (Shaw Environmental 2004). Deicing fluid not recovered is discharged to the Base's storm water system, which flows into Bass Lake and the Mad River. However, as discussed in Section 3.7.2, Wright-Patterson AFB revised their NPDES storm water permit. The

revised permit became effective on June 1, 2004, and requires the monitoring of glycol discharge into surface waters. In the future, a greater percentage, approximately 70 percent, will be captured to reduce glycol discharge into surface water. However, the means to accomplish 70 percent capture has not yet been decided.

Hazardous Waste. The 88 ABW maintains a Hazardous Waste Management Plan (WPAFB 2001b) as directed by AFI 32-7042, *Solid and Hazardous Waste Compliance*. This plan prescribes the roles and responsibilities of all members of Wright-Patterson AFB with respect to the waste stream inventory, waste analysis plan, hazardous waste management procedures, training, emergency response, and pollution prevention. The plan establishes the procedures to comply with applicable Federal, state, and local standards for solid waste and hazardous waste management.

Wastes generated at Wright-Patterson AFB include waste flammable solvents, contaminated fuels and lubricants, paint/coating, stripping chemicals, waste oils, waste paint-related materials, MSW, and other miscellaneous wastes. Management of hazardous waste is the responsibility of each waste-generating organization and Environmental Management Office (88 ABW/EM). Wright-Patterson AFB produces more than 1,000 kilograms of hazardous waste per month and is considered a large quantity hazardous waste generator. There are 150 satellite accumulation points on Base. There are two 90-day storage facilities and one Treatment, Storage, and Disposal Facility (TSD). The TSD is operated by 88 ABW/EM under a RCRA Part B permit and is located in Building 478/479. Most hazardous wastes are picked up by contract from the 90-day storage facilities and disposed of at an OEPA-approved site (WPAFB 2001b).

Asbestos-Containing Materials. AFI 32-1052, *Facilities Asbestos Management*, provides the direction for asbestos management at USAF installations. This instruction incorporates by reference applicable requirements of 29 CFR 669 et seq., 29 CFR 1910.1025, 29 CFR 1926.58, 40 CFR 61.3.80, Section 112 of the CAA, and other applicable AFIs and DOD Directives. AFI 32-1052 requires bases to develop an Asbestos Management Plan for the purpose of maintaining a permanent record of the status and condition of ACM in installation facilities, as well as documenting asbestos-management efforts. In addition, the instruction requires installations to develop an asbestos operating plan detailing how the installation accomplishes asbestos-related projects. Asbestos is regulated by USEPA with the authority promulgated under OSHA, 29 U.S.C. 669, et seq. Section 112 of the CAA regulates emissions of asbestos fibers to ambient air. USEPA policy is to leave asbestos in place if disturbance or removal could pose a health threat.

The 88 ABW/EM has developed standard contract specifications for the removal and disposal of ACM. These specifications incorporate all applicable USEPA, OSHA, and Department of Transportation requirements. The Ohio Department of Health (ODH) must license contractors, and all asbestos-abatement work must be done under the onsite supervision of an ODH-designated "competent person." Work area monitoring for airborne asbestos fibers is accomplished by an industrial hygienist certified by the American Board of Industrial Hygiene. Industrial hygiene technicians must also be certified by the ODH. Laboratory analyses of air samples and of bulk samples must be accomplished in a certified and accredited laboratory. Nonfriable ACM can be disposed of in a sanitary landfill. Friable asbestos must be disposed of in a USEPA-approved landfill. ACM-abatement contractors are responsible for obtaining all required permits from regulatory agencies and for OEPA and ODH notification requirements (WPAFB 2001b).

There was a Base-wide survey for friable ACM in 1988, and friable ACM has been removed from over 100 buildings on the Base. Wright-Patterson AFB has implemented an Asbestos Management Plan to minimize risk from friable ACM in buildings where the material remains. Additional sampling is usually required in buildings scheduled for renovation or demolition (WPAFB 2001b).

Lead-Based Paint. The Residential Lead-Based Paint Hazard Reduction Act of 1992, Subtitle B, Section 408 (commonly called Title X), passed by Congress on October 28, 1992, regulates the use and disposal of LBP on Federal facilities. Federal agencies are required to comply with applicable Federal, state, and local laws relating to LBP activities and hazards.

USAF policy and guidance establishes LBP management at USAF facilities. The policy incorporates, by reference, the requirements of 29 CFR 1910.120, 29 CFR 1926, 40 CFR 50.12, 40 CFR 240 through 280, the CAA, and other applicable Federal regulations. Additionally, the policy requires each installation to develop and implement a facility management plan for identifying, evaluating, managing, and abating LBP hazards.

More than 95 percent of Wright-Patterson AFB facilities were constructed prior to 1980 and contain LBP. Lead concentrations are generally low with the exception of paints used on outdoor structures such as water towers. The HUD action level is 5,000 ppm. However, even when concentrations are below this, OSHA Lead Construction Standard (29 CFR 1926.62) must be followed. All workers performing lead abatement or removal or any other lead disturbance are required to have a lead workers license issued by the ODH. Licensing is not required if the contract involves mechanical demolition. Contractors containerize LBP wastes which are disposed of under contract.

Bioenvironmental engineering samples and monitors all in-house projects involving LBP (WPAFB 2001b).

Environmental Restoration Program. ERP is a subcomponent of the Defense Environmental Restoration Program that became law under SARA (formerly the Installation Restoration Program). The ERP requires each DOD installation to identify, investigate, and clean up hazardous waste disposal or release sites.

Wright-Patterson AFB began its ERP in 1981 with the investigation of possible locations of hazardous waste contamination. In 1988, Wright-Patterson AFB entered into an Ohio Consent Order with the OEPA. In October 1989, Wright-Patterson AFB was placed on USEPA's National Priorities List, a list of sites that are considered to be of special interest and require immediate attention (WPAFB 2001b).

There are 68 ERP sites on Wright-Patterson AFB (WPAFB 2001b). The types of ERP sites on Base include closed landfills, earthfill disposal zones, spill sites, fire training areas, central heat plants, USTs, coal storage piles, chemical disposal areas, radioactive waste sites, and burial sites. In response to USAF restoration goals, all known ERP sites requiring further action were grouped into 11 Operable Units (OUs) by geographic location. In 1994, the Wright-Patterson project team established the groundwater OU concept under the Base-Wide Monitoring Program to address groundwater on a "regional scale." Principal groundwater contaminants beneath Wright-Patterson AFB include benzene, toluene, ethylbenzene, and xylene; trichloroethene; and tetrachloroethene (WPAFB 2001b).

4. Environmental Consequences

Section 4 presents an evaluation of the environmental impacts that might result from implementing the Proposed Action or the No Action Alternative. This section focuses on impacts considered potentially adverse. The general approach followed throughout this section is to describe briefly the range of impacts that could occur and then discuss impacts that are considered adverse.

The specific criteria for evaluating impacts and assumptions for the analyses are presented under each resource area. Evaluation criteria for most potential impacts were obtained from standard criteria; Federal, state, or local agency guidelines and requirement; and/or legislative criteria. Long-term implications of the Proposed Action are also presented in this section.

The impact of an action is measured in terms of its context and intensity. The extent to which a proposed action might affect an environmental resource depends on many factors. In some cases, environmental resources might be affected directly; in others, indirectly; and, in some cases, not at all.

Intensity refers to the severity of impact. Impacts may be beneficial or adverse. Consideration must be given to whether an impact affects public health or safety and whether it affects areas having unique characteristics, such as historical or cultural resources, wetlands, or ecologically critical areas. The level of impacts could also depend on the degree of their being controversial or posing highly uncertain, unique, or unknown risks. Adverse impacts might be found where an action sets a precedent for future actions having adverse effects, as well as in cases involving cumulative impacts. In considering intensity, consideration must be given to the degree to which the action might adversely affect animal or plant species listed as endangered or threatened or their habitat. Finally, in evaluating intensity, consideration must be given to whether an action violates a law or regulation imposed for the protection of the environment.

4.1 Airspace Management

4.1.1 Evaluation Criteria

Impacts on airspace use were assessed by comparing the projected military flight operations with existing conditions and with forecasted civil aviation activities in the defined ROI. This assessment included analyzing the capability of affected airspace elements to accommodate projected military activities, and determining whether such increases would have any adverse impacts on overall airspace use in the area. Also included are considerations of the interaction of the proposed use of

specific airspace with adjacent controlled, uncontrolled, or other military training airspace; possible impacts on other nonparticipating civil and military aircraft operations; and possible impacts on civil airports that underlie or are proximate to the airspace involved in the proposal. The ROI for airspace management has been limited to Wright-Patterson AFB and the transitional airfields.

4.1.2 Proposed Action

Wright-Patterson AFB. Effects on airspace management are predicated on the extent to which the Proposed Action would affect air traffic in the vicinity of Wright-Patterson AFB and the navigable airspace in an enroute environment. For additional information regarding Airspace Management, see Section 3.1.1.

Total airfield operations would decrease by approximately 53.7 percent under the Proposed Action (see Table 2-3). These changes would occur because the 445 AW would reduce its PAA by six aircraft. Training requirements on the C-5 aircraft would be similar to what is currently being flown in C-141C aircraft. ATC operations would remain similar since the C-141C and C-5 aircraft fly at similar speeds and possess the same wake turbulence category.

Table 2-1 shows the total amount of PAA aircraft that would be based at Wright-Patterson AFB throughout the 445 AW's transition from the C-141C to the C-5. Beginning with the first quarter of FY 05, 16 C-141C aircraft would be based at Wright-Patterson AFB. This is the largest number of aircraft on the Base throughout the duration of the transition, which would have little effect on the airspace surrounding Wright-Patterson AFB. By the second quarter of FY 07, there would be ten C-5 aircraft based at Wright-Patterson AFB. Overall, the Proposed Action would have a beneficial effect on airfield operations at Wright-Patterson AFB. The Detroit Airports District Office of the FAA concurs that the conversion to C-5 aircraft would not result in changes to the navigable airspace and, therefore, has no objections to the Proposed Action (refer to comment in Appendix A).

Transitional Airfields. Under the Proposed Action, the 445 AW would visit these airfields approximately one time per month, which is the average frequency for those flying the C-141C (Crago 2004). The proposed C-5 aircraft operations would be conducted within the parameters of the existing Letters of Agreement with the transitional airfields. Therefore the Proposed Action would not have an adverse effect on transitional airfields.

4.2 Noise

4.2.1 Evaluation Criteria

Noise impact analyses typically evaluate potential changes to existing noise environments that would result from implementation of a proposed action. Potential changes in the noise environment can be beneficial (i.e., if they reduce the number of sensitive receptors exposed to unacceptable noise levels), negligible (i.e., if the total area exposed to unacceptable noise levels is essentially unchanged), or adverse (i.e., if they result in increased noise exposure to unacceptable noise levels). Projected noise impacts were evaluated quantitatively for the Proposed Action.

4.2.2 Proposed Action

Construction Program. Implementation of the Proposed Action would have minor, temporary effects on the noise environment near the project sites resulting from the use of heavy equipment for construction. The nearby facilities would experience muffled construction noise during the workday. However, noise generation would last only for the duration of construction activities, and could be reduced through the use of equipment exhaust mufflers and restriction of construction and demolition activities to normal working hours (between 7:00 a.m. and 5:00 p.m.). Because the noise environment on Base and in the vicinity of Wright-Patterson AFB is dominated by military aircraft overflights, noise produced by construction and demolition activities would not affect sensitive receptors on or off the Base. Noise associated with construction and demolition activities would be comparatively minor, and would occur in relatively remote areas of the Base.

Aircraft Operations. Noise is a principal concern associated with aircraft operations. The main issues concerning noise effects on humans are physiological effects such as hearing loss and nonauditory effects, behavioral effects such as speech or sleep interference and performance effects, and subjective effects such as annoyance. These issues are discussed in greater detail in Appendix B. Noise impacts would be considered adverse if increased noise levels resulted in land use incompatibility. According to the 445th Public Affairs office, the last noise complaint received concerning C-141 or C-5 aircraft at Wright-Patterson AFB was on August 1, 2001.

In addition to the Current Mission Noise Contours presented in Section 3 of this EA, the 1995 AICUZ Study analyzed a Maximum Mission Scenario. Based on reasonable assumptions at the time of the 1995 AICUZ Study, the Maximum Mission Scenario analyzed a potential increase in F-16, F-15, C-141, and C-5 aircraft operations. Although it is not feasible for all these aircraft to be stationed at

Wright-Patterson AFB at any one time, each aircraft contributes to the noise environment in a different way and were therefore considered.

Under the Proposed Action, the number of C-141C airfield operations would be reduced to zero and the number of C-5 airfield operations would increase to 4,000 by 2007, which equates to a 53.7 percent reduction in airfield operations. Review of the Proposed Action airfield operations showed that the conversion from C-141C to C-5 aircraft would not increase the footprint of Wright-Patterson AFB's Maximum Mission Scenario Noise Contours. Although there is a slight increase in the amount of noise generated by the C-5 aircraft when compared to the C-141C (see Table 3-1), the change in noise is due to the decrease in airfield operations and varying flight profiles. The area exposed to the noise levels of DNL 65 dBA or higher under the Proposed Action and Maximum Mission Noise Contours is shown in Table 4-1. Due to the facts that the Maximum Mission Scenario accounted for both C-141C and C-5 airfield operations and the Proposed Action would eliminate all C-141C airfield operations, implementation of the Proposed Action would have a beneficial impact on the noise environ when compared to the Maximum Mission Scenario. Figure 4-1 presents the Proposed Action and Maximum Mission Scenario Noise Contours.

Table 4-1. Proposed Action and Maximum Mission Noise Contour Acreages in the Vicinity of Wright-Patterson AFB

Contour Value (DNL)	Maximum Mission	Proposed Action	Percent Change
65–69 dBA	10,028	9,006	-10.19%
70–74 dBA	6,800	6,605	-2.87%
75–79 dBA	2,856	2,697	-5.57%
80 + dBA	2,442	2,327	-4.71%
Total	22,126	20,635	-6.74%

4.3 Land Use

4.3.1 Evaluation Criteria

Potential impacts on land use are based on the level of land use sensitivity in areas affected by a proposed action and compatibility of proposed actions with existing conditions. In general, a land use impact would be adverse if it met the following criteria:

- Inconsistency or noncompliance with existing land use plans or policies
- Precluded the viability of existing land use
- Precluded continued use or occupation of an area

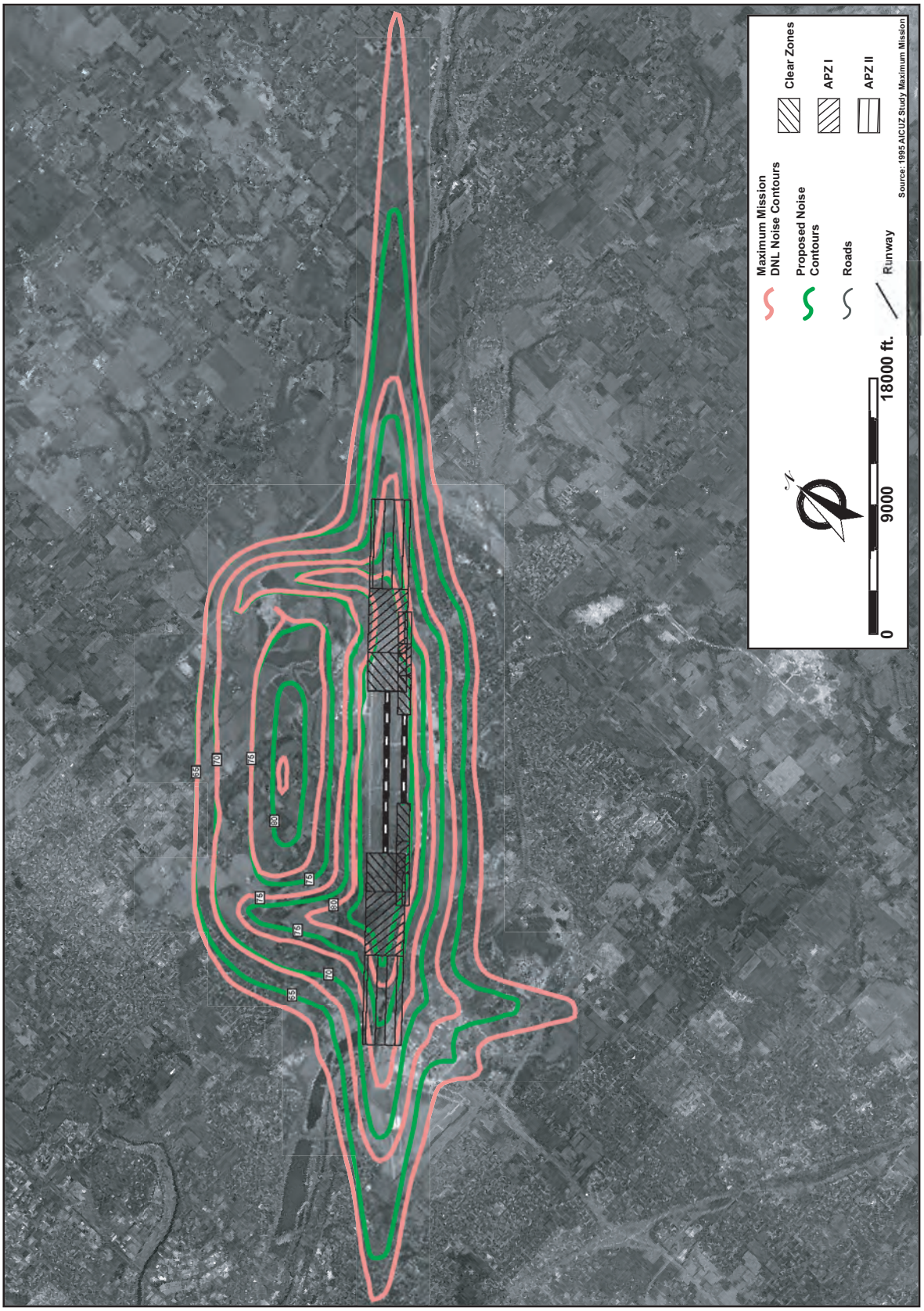

Figure 4-1. Proposed and Maximum Mission Noise Contours at Wright-Patterson AFB

- Incompatibility with adjacent land use to the extent that public health or safety is threatened
- Conflict with planning criteria established to ensure the safety and protection of human life and property

4.3.2 Proposed Action

There would be no adverse effects on the land use surrounding Wright-Patterson AFB. All construction and demolition activities would be limited to areas located on the Base. The construction projects would replace existing inadequate facilities and upgrade capabilities necessary to perform required activities. Construction and demolition projects would occur on two types of land classified as improved lands: Aircraft Operations and Maintenance, and Aircraft Taxiways (WPAFB 1995b). Effects associated with construction, demolition, and removal of construction materials and debris would include temporary disruption of land uses due to elevated noise levels, increased dust, interference with roadway access, and visual effects. Figure 4-2 shows the proposed noise contours and existing land use. No changes to land use would occur at Wright-Patterson AFB as a result of the Proposed Action.

4.4 Air Quality

4.4.1 Evaluation Criteria

The environmental consequences to local and regional air quality conditions near a proposed Federal action are determined based upon the increases in regulated pollutant emissions relative to existing conditions and ambient air quality. For the purposes of this EA, the impact in NAAQS "attainment" areas would be considered significant if the net increases in pollutant emissions from the Federal action would result in any one of the following scenarios:

- Cause or contribute to a violation of any national or state ambient air quality standard
- Expose sensitive receptors to substantially increased pollutant concentrations
- Represent an increase of 10 percent or more in an affected AQCR emissions inventory
- Exceed any Evaluation Criteria established by a SIP

As mentioned in Section 3, the area including Wright-Patterson AFB is classified as a moderate maintenance area for O_3 and is designated as an unclassified/attainment area for all other criteria pollutants.

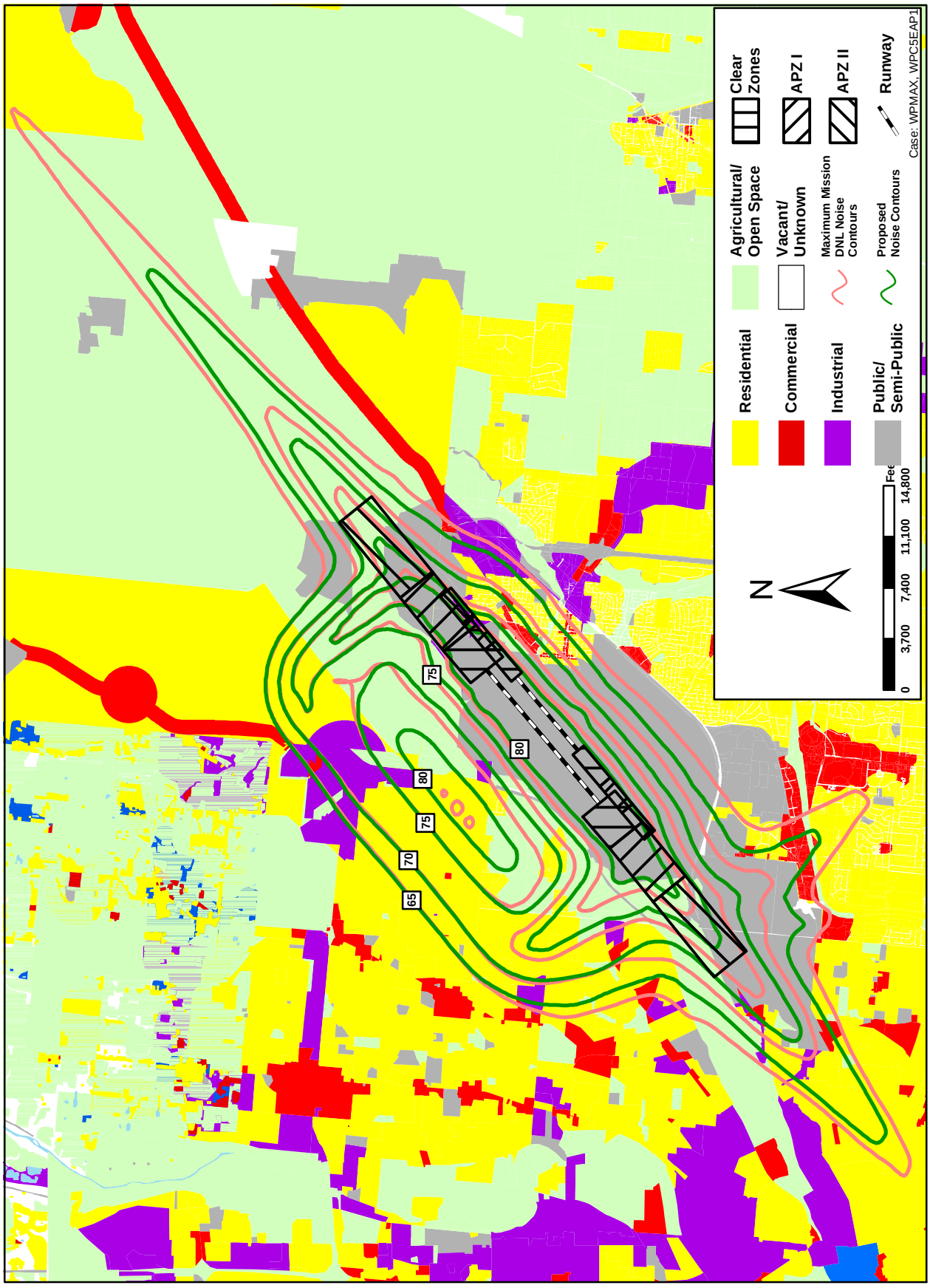

Figure 4-2. Existing Land Use and Proposed and Maximum Mission Noise Contours at Wright-Patterson AFB

Impacts on air quality in NAAQS "nonattainment" areas are considered significant if the net changes in project-related pollutant emissions result in any of the following scenarios:

- Cause or contribute to a violation of any national or state ambient air quality standard
- Increase the frequency or severity of a violation of any ambient air quality standard
- Delay the attainment of any standard or other milestone contained in the SIP

Because Wright-Patterson AFB is located in an area designated as maintenance for O_3, a conformity applicability analysis is required to determine whether the Proposed Action is subject to the Conformity Rule. With respect to the General Conformity Rule, effects on air quality would be considered significant and, therefore, subject to an evaluation to determine compliance with the General Conformity Rule, if

- The proposed Federal action would result in an increase of a nonattainment or maintenance area's emission inventory by 10 percent or more for one or more nonattainment pollutants.
- The Proposed Action-related emissions exceed *de minimis* threshold levels established in 40 CFR 93.153(b) for individual nonattainment pollutants or for pollutants for which the area has been re-designated as a maintenance area.

The *de minimis* threshold emission rates were established by USEPA in the General Conformity Rule to focus analysis requirements on those Federal actions with the potential to have "significant" air quality impacts. Table 4-2 presents these thresholds, by regulated pollutant. These *de minimis* thresholds are similar, in most cases, to the definitions for major stationary sources of criteria and precursors to criteria pollutants under the CAA's New Source Review (NSR) Program (CAA Title I). As shown in Table 4-2, *de minimis* thresholds vary depending on the severity of the nonattainment area classification.

In addition to the *de minimis* emission thresholds, Federal PSD regulations define air pollutant emissions to be significant if the source is within 10 kilometers of any Federal Class I area (e.g., wilderness area greater than 5,000 acres or national park greater than 6,000 acres) and emissions would cause an increase in the concentration of any regulated pollutant in the Class I area of 1 $\mu g/m^3$ or more [40 CFR 52.21(b)(23)(iii)]. Although PSD rules apply only to stationary sources of emissions, for the purposes of this EA, such an impact to a Class I area would be considered adverse.

Table 4-2. Conformity *de minimis* Emission Thresholds

Pollutant	Status	Classification	*de minimis* Limit (tpy)
Ozone (measured as NO_x or VOCs)	Nonattainment	Extreme	10
		Severe	25
		Serious	50
		Moderate/marginal (inside ozone transport region)	50 (VOCs)/100 (NO_x)
		All others	100
	Maintenance	Inside ozone transport region	50 (VOCs)/100 (NO_x)
		Outside ozone transport region	100
Carbon Monoxide (CO)	Nonattainment/ maintenance	All	100
Particulate Matter (PM_{10})	Nonattainment/ maintenance	Serious	70
		Moderate	100
		Not applicable	100
Sulfur Dioxide (SO_2)	Nonattainment/ maintenance	Not applicable	100
Nitrogen Oxides (NO_x)	Nonattainment/ maintenance	Not applicable	100

Source: 40 CFR 93.153
tpy: tons per year

4.4.2 Proposed Action

Air Quality Regulations Applicable to the Proposed Action

Stationary Sources and New Source Review. Local and regional pollutant impacts resulting from direct and indirect emissions from stationary emission sources under the Proposed Action are addressed through Federal and state permitting program requirements under NSR regulations (40 CFR 51 and 52). Local stationary source permits are issued and enforced by RAPCA. As noted previously, Wright-Patterson AFB has appropriate permits in place and has met all applicable permitting requirements and conditions for existing stationary devices.

New or modified stationary sources that might require operating permits include the relocation of aircraft spot painting from Hangar 4024 to the new maintenance hangar. The change in location and paint types will necessitate a modification to the Base Title V operating permit and to all permits to install for the affected sources. Changes or additions to insignificant emissions sources that would trigger administrative updates to the Base Title V operating permit include changes to the fuel

handling/dispensing systems and any new natural gas heating boilers that may be installed in building construction and renovations.

National Emissions Standards for Hazardous Air Pollutants. Because Wright-Patterson AFB has the potential to emit more than 25 tpy of hazardous air pollutants, certain hazardous air pollutant-emitting activities on Base are subject to regulation under Federal National Emissions Standards for Hazardous Air Pollutants (NESHAP). NESHAP are promulgated in 40 CFR Parts 61 and 63. These NESHAP require emissions control measures and detailed recordkeeping to show compliance with NESHAP restrictions on the types of materials, such as paints, adhesives, and solvents, which can be used in specific operations. Specific NESHAP to which activities at Wright-Patterson AFB are subject include

- 40 CFR 63 Subpart GG, Aerospace NESHAP
- 40 CFR 63 Subpart DDDDD, Industrial/Commercial/Institutional Boilers and Process Heaters
- 40 CFR 61 Subpart M, Asbestos Remediation
- 40 CFR 63 Subpart T, Halogenated Solvent Cleaning

In addition, Wright-Patterson AFB would also be subject to the Defense Land Systems and Miscellaneous Equipment (DLSME) NESHAP when that rule is promulgated. This rule would cover military surface coating operations other than those subject to the Aerospace and Shipbuilding NESHAP. The intent is to simplify compliance for DOD facilities that are currently forced to comply with multiple overlapping, and sometimes conflicting, NESHAP, including the Miscellaneous Metal Parts and Products Coating NESHAP, Plastic Parts and Products Coating NESHAP, Metal Furniture Coating NESHAP, Large Appliance Coating NESHAP, and Fabric and Other Textiles Coating NESHAP. USEPA currently has no date set for publication of a draft DLSME NESHAP.

Conformity. Because a maintenance area is affected by this Proposed Action, the USAF must comply with the Federal General Conformity Rule. To do so, an analysis has been completed to ensure that, given the changes in direct and indirect emissions of the O_3 precursors (NO_x and VOCs), the Proposed Action would be in conformity with CAA requirements. The Conformity Determination requirements specified in this rule can be avoided if the project nonattainment pollutant rates are below *de minimis* threshold levels for nonattainment pollutants and are not considered regionally significant. For purposes of determining conformity in these nonattainment areas, projected regulated pollutant emissions associated with the Proposed Action were estimated using available aircraft operations data and emissions information. The emissions calculations and *de*

minimis threshold comparisons are collectively presented in the Air Conformity Analysis provided in Appendix C.

Based on a review of current C-141C activities and other airfield operations at Wright-Patterson AFB, it has been determined that the potential sources of NO_x and VOC pollutant emissions associated with the Proposed Action would be from (1) construction activities associated with the Proposed Action; (2) aircraft operations, maintenance, and support activities after delivery of the C-5 aircraft; and (3) motor vehicle emissions. Under the proposal, the first of the C-5 aircraft would be delivered in the first quarter of FY 06. The construction activities would be complete before the full fleet of C-5 aircraft would be in operation. The scope of the analysis was limited to those operations or activities that result in emissions that would be directly or indirectly attributable to the implementation of the Proposed Action.

The potential air quality impacts have been assessed based on the characteristics of the Proposed Action (i.e., aircraft operations, construction) and are presented below.

Proposed Action Direct and Indirect Emissions

Construction Activities. The Proposed Action consists of the ten construction projects at various locations and facilities throughout Wright-Patterson AFB. These projects address the requirements for the C-5 airframe and support facilities. They include demolition or modification of existing buildings and the construction of new facilities as well as smaller modifications and additions to existing structures.

The construction projects would generate total suspended particulate and PM_{10} emissions as fugitive dust from ground-disturbing activities (e.g., grading, demolition, soil piles) and combustion of fuels in construction equipment. Fugitive dust emissions would be greatest during the initial site preparation activities and would vary from day to day depending on the construction phase, level of activity, and prevailing weather conditions. The quantity of uncontrolled fugitive dust emissions from a construction site is proportional to the area of land being worked and the level of construction activity.

Fugitive dust emissions for various construction activities were calculated using emissions factors and assumptions published in USEPA's AP-42 Section 11.9 dated July 1998 and Section 13.2 dated September 1998. These estimates assume that 230 working days are available per year for construction (accounting for weekends, weather, and holidays). Using data from the National Oceanic and Atmospheric Administration (NOAA), the average soil percent moisture was estimated

to be 85 percent (NOAA 2003). Wind speeds of greater then 12 mph are recorded 12 percent of the time, based on average wind rose data and measured speed for the city of Dayton, Ohio (NRCC 2004).

Construction operations would also result in emissions of criteria pollutants as combustion products from construction equipment as well as evaporative emissions from architectural coatings and asphalt paving operations. These emissions would be of a temporary nature. The emissions factors and estimates were generated based on guidance provided in Air Quality Thresholds of Significance from the Sacramento Metropolitan Air Quality Management District (SMAQMD 1994).

Specific information describing the types of construction equipment required for a specific task, the hours the equipment is operated, and the operating conditions vary widely from project to project. For purposes of analysis, these parameters were estimated using established methodologies for construction and experience with similar types of construction projects. Combustion by-product emissions from construction equipment exhausts were estimated using USEPA's AP-42 emissions factors for heavy-duty diesel-powered construction equipment.

The construction emissions presented in Table 4-3 include the estimated annual emissions from off-road construction equipment exhaust as well as on-road commuting vehicle exhaust associated with the Proposed Action construction activities. As with fugitive dust emissions, off-road construction equipment emissions would produce locally elevated air pollutant concentrations. Early phases of construction projects involve heavier diesel equipment and earthmoving, resulting in higher NO_x and PM_{10} emissions. Later phases of construction projects involve more light gasoline equipment and surface coating, resulting in more CO and VOC emissions. However, the effects would be temporary, fall off rapidly with distance from the proposed construction site, and would not result in long-term impacts.

Aircraft Operations. Emissions from airfield operations at Wright-Patterson AFB affect Greene and Montgomery counties which are included in the Metropolitan Dayton Intrastate AQCR. Calculations of airfield air pollutant emissions from both baseline and Proposed Action aircraft operations were based on the annual number of landing-and-takeoff and TGO cycles at the Wright-Patterson AFB airfield.

Table 4-3. Net Change in Emissions at Wright-Patterson AFB Associated with the Proposed Action

Air Pollutant Emissions Source	NO_x Emissions (tpy)	VOC Emissions (tpy)	CO Emissions (tpy)	SO_2 Emissions (tpy)	PM_{10} Emissions (tpy)
Baseline Emissions (Airfield Operations Only) [a]	**53.4**	**97.9**	**148.5**	**12.7**	**36.6**
CALENDAR YEAR 2005					
Airfield Operations Emissions Net Increase	-8.3	-25.3	-37.7	-3.0	-9.7
Construction Emissions [b]	23.2	8.1	28.8	1.2	14.6
Motor Vehicle Net Emissions Increase [c]	0.0	0.0	0.0	0.0	0.0
Total 2005 Proposed Action Emissions Increase	**10.5**	**-17.6**	**-9.9**	**-1.9**	**4.6**
Percent of AQCR Emissions	**0.02%**	**-0.03%**	**0.00%**	**-0.02%**	**-0.01%**
CALENDAR YEAR 2006					
Airfield Operations Emissions Net Increase [a]	36.9	-72.2	-98.5	-4.7	-25.2
Construction Emissions [b]	36.1	11.8	50.0	1.8	18.4
Motor Vehicle Net Emissions Increase [c]	1.4	1.1	14.4	0.1	0.9
Total 2006 Proposed Action Emissions Increase	**68.1**	**-59.8**	**-35.5**	**-2.8**	**-6.4**
Metropolitan Dayton Intrastate AQCR Emissions	**48,907**	**55,758**	**364,075**	**12,346**	**51,792**
Percent of AQCR Emissions	**0.12%**	**-0.11%**	**-0.01%**	**-0.02%**	**-0.01%**
CALENDAR YEAR 2007					
Airfield Operations Emissions Net Increase [a]	78.8	-88.9	-115.3	-3.6	-30.2
Construction Emissions [b]	16.5	6.0	19.3	0.8	3.8
Motor Vehicle Net Emissions Increase [c]	1.4	1.1	14.4	0.1	0.9
Total 2007 Proposed Action Emissions Increase	**91.2**	**-82.3**	**-82.8**	**-2.8**	**-26.0**
Metropolitan Dayton Intrastate AQCR Emissions	**48,907**	**55,758**	**364,075**	**12,346**	**51,792**
Percent of AQCR Emissions	**0.19%**	**-0.15%**	**-0.02%**	**-0.02%**	**-0.05%**

Notes:

[a] Airfield emissions include landings and take-offs, touch-and-goes (TGOs), auxiliary power unit operation, aerospace ground equipment (AGE), and on-wing engine tests.

[b] Construction emissions include soil-disturbing activities, wind-blown dust, paving, painting, nonmobile and mobile motorized construction equipment, and construction worker commute emissions.

[c] Motor vehicle emissions increases include privately-owned commute vehicles for added staff, as well as government-owned on-road and off-road vehicles used on Base.

tpy: tons per year

As mentioned in Section 2.2, operations that would be performed by the C-5 aircraft would be similar to current operations performed by the C-141C aircraft. Low-level military airspace would not be used by the 445 AW. Use of established airspace with a base altitude of 3,000 feet AGL is not expected to affect ground level air quality and does not require environmental analysis in accordance with the USAF EIAP, 32 CFR 989, as amended. In addition, the Proposed Action would reduce the number of airfield operations and flight hours by more than 50 percent, relative to current levels.

Current C-141C airfield emissions are based on airfield activities over the past 5 years. A 5-year average was used because world events since September 11, 2001, have resulted in highly variable and unusual military aircraft operations. A 5-year average, including both pre-9/11 and post-9/11 activities was deemed to be the best representation of "baseline" conditions.

Projected C-5 airfield operations are based on a review of AFRC C-5 operations at Lackland AFB, Texas and Westover Air Reserve Base (ARB), Massachusetts. This review looked at pre-9/11 and post-9/11 activities to identify the level of activity for both landings and takeoffs and TGOs. For this analysis, it was assumed that the per-aircraft activity levels at Wright-Patterson AFB could be approximately 110 percent of the maximum levels observed at the other two C-5 AFRC bases.

Aerospace Ground Equipment and Aircraft Support Operations. Because the number of aircraft and the total aircraft operations would be reduced under the Proposed Action, emissions from Aerospace Ground Equipment (AGE) are expected to be reduced by approximately 30 percent. This is because, with the exception of heaters and air conditioners, AGE usage tends to be proportional to the number of aircraft operations and independent of the size of the aircraft. The change in AGE emissions is included in the calculations in Appendix C.

Vehicle Operations. Calculations of air pollutant emissions from privately owned vehicles (POVs) used for commuting were based on the vehicle miles traveled, vehicle category or classification (e.g., light-duty gasoline vehicle), average vehicle speed measured in mph, average vehicle occupancy rate, and USEPA-approved pollutant emission factors. Emissions factors from USEPA's mobile source emission model, MOBILE5a, were used to estimate emissions from motor vehicles. The increase in staff associated with the Proposed Action (173 staff) is expected to result in a corresponding increase in motor vehicle commute emissions in the Dayton Metropolitan area.

The same on-road and off-road government-owned vehicles (GOVs) currently supporting C-141C operations would also be used to support C-5 basing and operations. Because the AFRC aircraft support staff would be increasing by approximately 10 percent, it was assumed for this analysis that

the usage of on-road and off-road GOVs would also increase by approximately 10 percent. Calendar year 2003 activity data for the GOVs were collected, and the corresponding emissions were scaled up 10 percent. This increase in emissions has been included in the motor vehicle emissions estimates.

Analysis. The information presented in Table 4-3 shows that VOC, CO, SO_2, and PM_{10} emissions are projected to decrease under the Proposed Action at Wright-Patterson AFB. However, NO_x emissions would increase. The year 2007 was selected for Table 4-3 because it is projected to be the maximum emissions year for basewide NO_x emissions. The years after 2007 are projected to have emissions equivalent to 2007 emissions, less construction emissions; therefore, projected impacts for all future years would be lower than 2007 impacts.

As shown in Table 4-3, the Proposed Action would not be expected to generate net emissions increases above conformity *de minimis* limits as specified in 40 CFR 93.153. Because the emissions expected from the Proposed Action would not exceed *de minimis* levels or regional significance thresholds, the General Conformity Rule does not apply and the Proposed Action can be deemed to be in conformity with the Ohio SIP. Appendix C details the emissions factors, calculations, and estimates of construction, airfield, and motor vehicle emissions for the Proposed Action.

According to 40 CFR 81, no Class I visibility areas are located within 10 kilometers of Wright-Patterson AFB. The closest Federal Class I area is Mammoth Cave National Park in Kentucky, 320 kilometers to the south. Therefore, air emissions from the Proposed Action would not affect any Class I area.

The Proposed Action is projected to result in net emissions reductions for all pollutants except NO_2. VOC emissions are projected to decrease by approximately the same amount as NO_2 emissions are projected to increase. Because the maximum Proposed Action-related net emissions increase (NO_2 in 2007) is below the General Conformity *de minimis* threshold of 100 tons per year, the project proponent concludes that there would be minor adverse impacts on air quality as a result of the Proposed Action.

4.5 Safety

4.5.1 Evaluation Criteria

Potential impacts were assessed based on direct effects from aircraft crashes (i.e., damage to aircraft and points of impact), as well as secondary effects, such as fire and environmental contamination. The extent of these secondary effects is situationally dependent and difficult to quantify. For

example, there would be a higher risk of fire from aircraft crashes in highly vegetated areas during a hot, dry summer than would be the case if the mishap occurred in a rocky, barren area during the winter. As stated in Section 3.5.1, historical mishap databases enable the military to calculate the mishap rates for each type of aircraft. These rates are based on the estimated flying time that an aircraft is expected to be in the airspace, the accident rate per 100,000 flying hours for that aircraft, and the annual flying hours for that aircraft.

4.5.2 Proposed Action

Fire Hazards and Public Safety. No effects regarding fire hazards or public safety would be expected to occur on Base from construction projects planned as part of the Proposed Action.

Aircraft Safety. Aircraft safety is a primary concern of those residing near military installations. According to 445 AW Public Affairs, several complaints have been received over the last few years from citizens concerned by low aircraft approaches, specifically by C-141 and C-5 aircraft. All complaints are investigated by the 445 AW to ensure that pilots are flying the correct approaches. Two public comment concerning low-flying approaches were received during the public comment period (see Appendix A). The 445 AW follows all designated and approved flight tracks, including altitudes, during training missions.

No adverse effects would be expected as a result of the Proposed Action. Historical data on C-5 mishaps are presented in Table 4-4. This table shows that the rate of Class A and Class B mishaps is approximately three mishaps per 100,000 hours of flight time for the C-5 aircraft (AFSC 2004f). This would be an increase from C-141 aircraft mishaps (less than one mishap per 100,000 hours of flight time—refer to Table 3-4 in Section 3.5.1), but the C-5 aircraft has cumulatively flown 1.7 million hours compared with 10.5 million hours for the C-141 over its life. Statistically, more flying hours indicate more proficient pilots, which results in fewer mishaps. The Proposed Action would also result in a decrease in the total number of aircraft operations by approximately 53.7 percent per year. Therefore, no adverse effects would be expected as a result of the Proposed Action.

Bird/Wildlife-Aircraft Strike Hazard. Continued adherence to the 445 AW BASH Plan would decrease the potential for bird/wildlife-aircraft strikes. Aircraft operations at Wright-Patterson AFB would decrease with implementation of the Proposed Action, which would also reduce the likelihood of a bird/wildlife-aircraft strike. Therefore, no adverse effects would be expected as a result of the Proposed Action.

Explosive Safety Zones. No effects on ESZs would occur as a result of the Proposed Action. Proposed construction would not be located within ESQD arcs (see Figure 4-3). Modifications to the parking apron would be approximately 1,500 feet from the ESQD arc for the weapons storage area, well outside the safety zone. The other safety zones indicated on Figure 4-3 (encircling the west ramp and the flight simulator parking aprons) are the ESQD arcs for areas used to unload and transport munitions. During active construction, munitions handling would not occur in there areas. Therefore, no effects on ESZs would occur as a result of the Proposed Action.

Table 4-4. Historical Data on C-5 Mishaps (FY 91 – FY 01)
Current as of February 5, 2002

Year	Class A		Class B		Fatal		Hours Flown	Cumulative Hours[2]
	No.	Rate[1]	No.	Rate[1]	Pilot	All		
FY 91	0	0.00	1	0.60	0	0	166,676	1,244,660
FY 92	0	0.00	1	1.51	0	0	66,324	1,310,984
FY 93	0	0.00	2	2.55	0	0	78,319	1,389,303
FY 94	0	0.00	4	5.49	0	0	72,899	1,462,202
FY 95	0	0.00	1	1.55	0	0	64,608	1,526,810
FY 96	0	0.00	0	0.00	0	0	67,499	1,594,309
FY 97	0	0.00	1	1.60	0	0	62,484	1,656,793
FY 98	0	0.00	0	0.00	0	0	64,506	1,721,299
FY 99	0	0.00	0	0.00	0	0	56,988	1,778,287
FY 00	0	0.00	2	3.78	0	0	52,872	1,831,159
FY 01	1	1.72	1	1.72	0	0	58,244	1,889,403
Lifetime [2]	**16**	**0.85**	**40**	**2.12**	**5**	**168**	**1,889,403**	

Source: AFSC 2004f
Notes:
[1] Rate of mishap per 100,000 hours flown.
[2] Cumulative hours represent lifetime mishap record totals from the beginning of C-5 operations (FY 68) to present.

Construction Safety. Minor adverse effects would be expected. Implementation of the Proposed Action would slightly increase the short-term risk associated with construction contractors performing work at Wright-Patterson AFB during the normal workday because of the increase in construction activities. Contractors would be required to establish and maintain safety programs. Projects associated with the Proposed Action would not pose a safety risk to Base personnel or to activities at the Base. Proposed construction projects would enable the 445 AW to meet future mission objectives at the Base, and conduct or meet mission requirements in a safe operating environment.

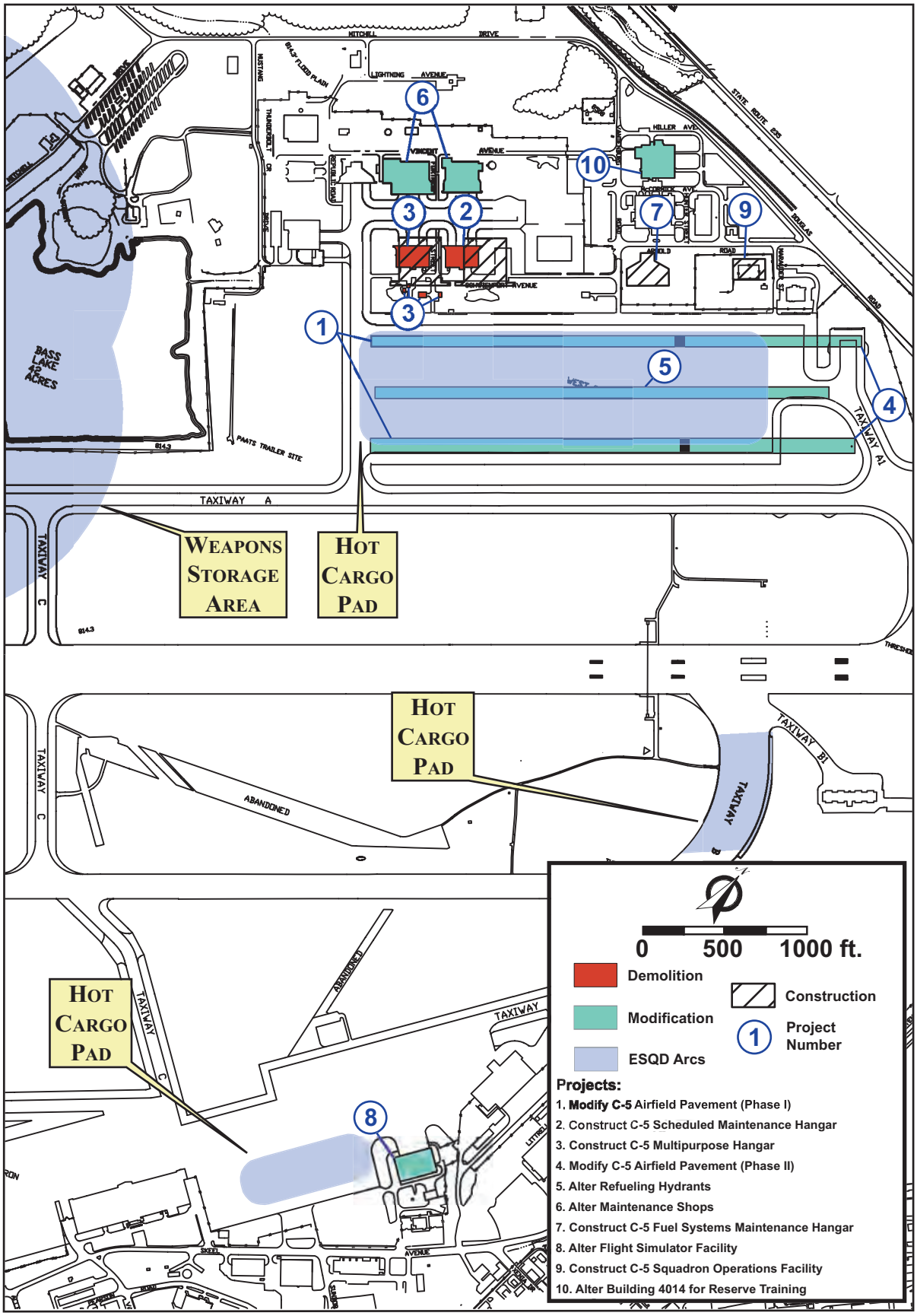

Figure 4-3. ESQD Arcs and Proposed Construction at Wright-Patterson AFB

4.6 Geological Resources

4.6.1 Evaluation Criteria

Protection of unique geological features, minimization of soil erosion, and the siting of facilities in relation to potential geologic hazards are considered when evaluating potential impacts of a proposed action on geological resources. Generally, impacts can be avoided or minimized if proper construction techniques, erosion control measures, and structural engineering design are incorporated into project development.

Analysis of potential impacts on geological resources typically includes the following steps:

- Identification and description of resources that could potentially be affected.
- Examination of a proposed action and the potential impacts this action may have on the resource.
- Assessment of the level of potential impacts.
- Provision of mitigation measures in the event that potentially adverse impacts are identified.

Effects on geology and soils would be adverse if they would alter the lithology, stratigraphy, and geological structure that control groundwater quality, distribution of aquifers and confining beds, and groundwater availability; or change the soil composition, structure or function within the environment.

4.6.2 Proposed Action

Short-term adverse effects on geological resources would be expected as a result of the Proposed Action, and would arise from construction and demolition activities. Construction activities, such as grading, excavating, and recontouring of the soil, would result in soil disturbance. Implementation of BMPs during construction would limit potential effects resulting from construction activities. Fugitive dust from construction activities would be minimized by watering and soil stockpiling, thereby reducing to negligible levels the total amount of soil exposed. Standard erosion control means (e.g., silt fencing, sediment traps, application of water sprays, and revegetation at disturbed areas) would also reduce potential impacts related to these characteristics.

The Proposed Action would not cause or create drastic changes to the topography of Wright-Patterson AFB or the surrounding area. Therefore, no effects on regional or local topography or physiographic features would result from implementation of the Proposed Action.

4.7 Water Resources

4.7.1 Evaluation Criteria

Evaluation criteria for impacts on water resources are based on water availability, quality, and use; existence of floodplains; and associated regulations. The Proposed Action would be adverse if it does one or more of the following:

- Reduces water availability or supply to existing users
- Overdrafts groundwater basins
- Exceeds safe annual yield of water supply sources
- Affects water quality adversely
- Endangers public health by creating or worsening health hazard conditions
- Threatens or damages unique hydrologic characteristics
- Violates established laws or regulations adopted to protect water resources

The effect of flood hazards on a proposed action is important if such an action is in an area with a high probability of flooding.

4.7.2 Proposed Action

Groundwater and Surface Water. The groundwater and surface water systems that surround Wright-Patterson AFB are closely interconnected. Runoff contaminants that might result from construction and aircraft operations that would impact surface water quality could also impact groundwater quality. Therefore, they are analyzed together.

Short-term adverse effects resulting from construction and modification of facilities would directly result in increased sediment runoff into drainage streams and the Mad River. Increased sediment runoff increases surface water turbidity, which raises water temperature and slows photosynthetic processes. However, BMPs, such as sediment fencing during active construction and revegetation of exposed areas immediately following construction, would confine runoff to the construction site and reduce the potential for drastically increased water turbidity. A sediment and erosion control plan would be developed to ensure the use of appropriate runoff measures. Assuming use of sediment and erosion control measures, there would be only minor, adverse effects on surface water quality as a result of the proposed construction. Surface water quality would be comparable to preconstruction conditions. An OEPA NPDES General Permit for construction activities would be required.

The Proposed Action involves an increase in impervious surfaces on Patterson Field at Wright-Patterson AFB. During large rainfall or snow-melt events, impervious surfaces increase the speed at which water flows into receiving water bodies by reducing infiltration into the ground. The potential for storm water to carry contaminants that could flow directly into surface waters (and infiltrate into groundwater) is also a concern when impervious areas increase. Compliance with the NPDES General Permit for construction and NPDES permit for storm water would ensure that there would be only minor, adverse effects from contaminant-laden storm water. To reduce the potential for adverse effects associated with the high quantity of storm water discharge from the construction areas, a site-specific storm water pollution prevention plan would be developed, which could include various BMPs. There would be minor, adverse effects on groundwater and surface water associated with increased impervious surfaces.

Aircraft operations under the Proposed Action are expected to decrease by over 50 percent (refer to Table 2-3). Though the C-5 aircraft are larger than the C-141C, the operations and maintenance of the aircraft would not change drastically. Fewer operations of the C-5 would have a slightly beneficial effect, if any, on groundwater and surface water quality. Proposed C-5 operations would involve the same types of hazardous materials that are already used at Wright-Patterson AFB with the C-141C aircraft, such as JP-8 or propylene glycol.

The Base's NPDES Permit for storm water discharge was recently revised and became effective on June 1, 2004. Under the provisions of the revised permit, the 445 AW and 88 ABW will be required to capture and collect a greater percentage of deicing fluid than it currently does to reduce glycol discharge into surface water bodies (from 40 percent to approximately 70 percent). There are no permitted discharge levels for glycols at this time. However, OEPA will gather data from November 2004 to March 2005 during the sampling period, and might issue a permit addendum as early as the summer of 2005. Glycol runoff into drainage streams, Bass Lake, and the Mad River represents a current problem and would not be further exacerbated by the Proposed Action since the amount of deicing fluid is projected to remain approximately the same (refer to Section 4.12.2). Currently, a mobile "Tennant 1550" vacuum unit is used to recover as much deicing fluid as possible (Shaw Environmental 2004). The 88 ABW is investigating BMPs and possible collection strategies, which include purchasing larger vacuum trucks, diluting deicing solution in spray trucks for the warmer parts of winter months, and a deicing pad requiring collection tanks. No decisions have been made regarding any of these options, though a method or device for containing and collecting a greater percentage of deicing fluid runoff will occur, regardless of the Proposed Action. Though procedures

or structures have not been designed at this time, the 455 AW and/or 88 ABW will reduce the amount of propylene glycol that is discharged to receiving water bodies.

Quantities of hazardous materials used would likely not increase dramatically because, though the C-5 is larger and requires more maintenance than the C-141C, there would be fewer C-5 aircraft at Wright-Patterson AFB, and they would operate less often. Refer to Section 4.12.2 for more detailed information regarding quantities of hazardous materials associated with the Proposed Action. Management plans are in place for hazardous or harmful materials should a spill occur. Therefore, though the Proposed Action would not pose any new risks, minor adverse effects on groundwater and surface water would continue to occur under the Proposed Action as a result of aircraft operations.

It is the recommendation of the Ohio Department of Natural Resources that the Proposed Action have adequate design for storm water and not only treat surface runoff but also contain potential spills and discharges (Sanders 2004). The proposed construction would be consistent with all Wright-Patterson AFB and Ohio environmental standards. Hangars would have appropriate drains to contain spills and leaks. The current oil/water separators (located in Building 4031) would be removed and replaced during construction associated with Project 2, the scheduled maintenance hangar.

Floodplains. Minor adverse effects would result from the Proposed Action. Portions of the parking apron are in the 100-year floodplain, so modifications to the parking apron (Projects 1 and 4) would affect the floodplain (see Figure 4-4). All other proposed construction projects are adjacent the 100-year floodplain. The MCD controls the flood protection system in the Great Miami River Watershed and has the right to back water on and over the property upstream of Huffman Dam. MCD policies would be followed. Any fill material required must come from within the floodplain to ensure no net gain or loss of soils within the retention basin.

According to EO 11988, *Floodplain Management*, any new construction in the regulatory floodplain must apply accepted flood protection to reduce the risk of flood-associated damages; minimize the impacts of floods on human safety, health, and welfare; and restore and preserve the natural and beneficial values served by floodplains. The step-by-step process for compliance with EO 11988 was conducted in conjunction with this EA and the IICEP process requesting input on the Proposed Action. IICEP coordination was sent to the MCD requesting comments on the Proposed Action.

The current configuration of the C-141C apron and aircraft maintenance buildings is in or adjacent to the 100-year floodplain. No additional, practical alternatives were identified that would meet the

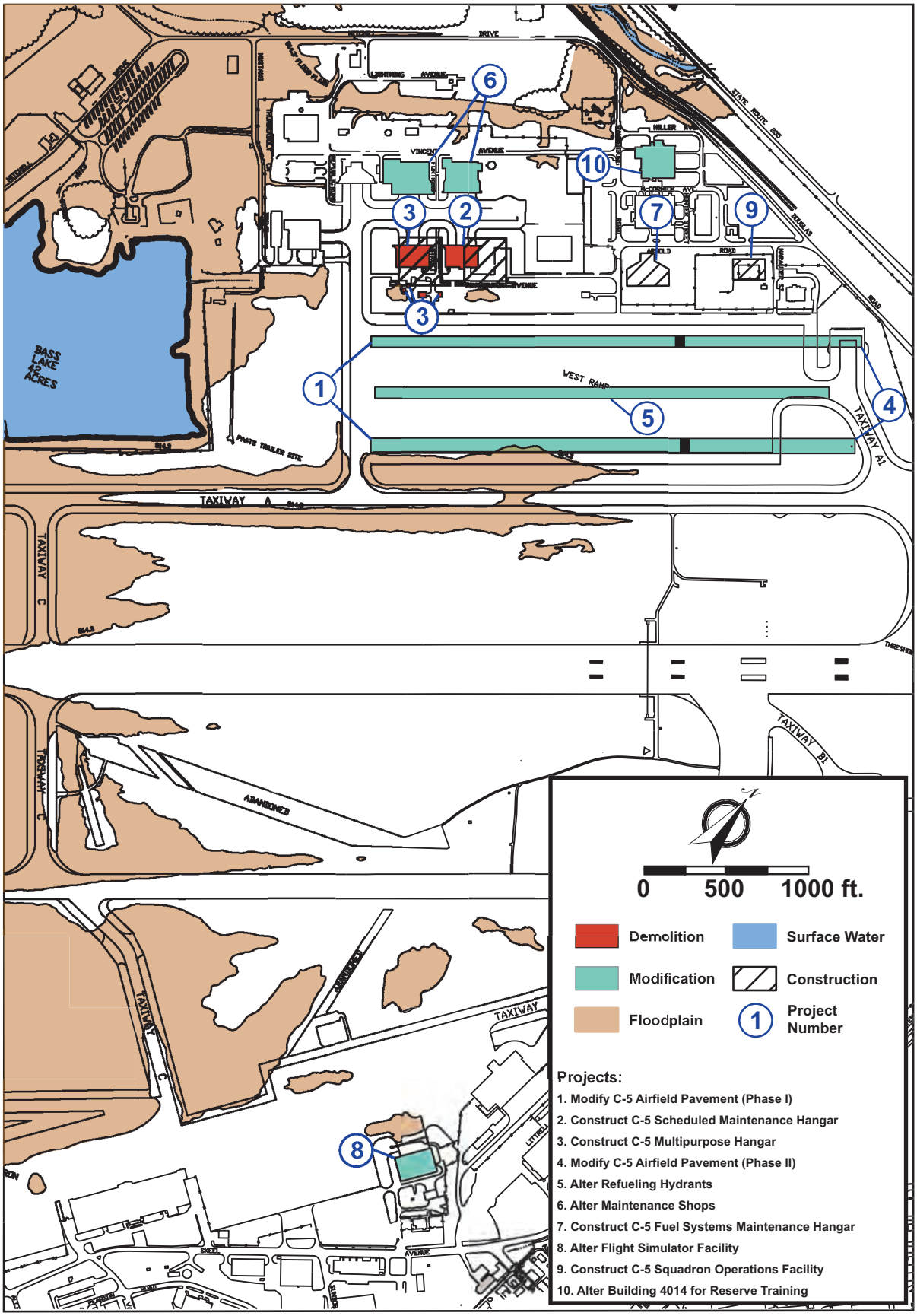

Figure 4-4. 100-Year Floodplain and Proposed Construction at Wright-Patterson AFB

objectives of the Proposed Action. Adverse effects, such as increased impervious surfaces, would be reduced using appropriate storm water detention measures. If the Proposed Action is pursued, the USAF will issue its findings in the FONSI/FONPA for this EA.

Therefore, there would be minor adverse effects associated with the proposed construction projects. However, adherence to Federal, state, local, USAF, and Wright-Patterson AFB regulations and guidelines would minimize these adverse effects.

4.8 Biological Resources

4.8.1 Evaluation Criteria

This section evaluates the potential impacts on the biological resources under the Proposed Action and the No Action Alternative. The level of impact on biological resources is based on (1) the importance (i.e., legal, commercial, recreational, ecological, or scientific) of the resource, (2) the proportion of the resource that would be affected relative to its occurrence in the region, (3) the sensitivity of the resource to the proposed activities, and (4) the duration of ecological ramifications.

The impacts on biological resources are adverse if species or habitats of high concern are negatively affected over relatively large areas. Impacts are also considered adverse if disturbances cause reductions in population size or distribution of a species of high concern.

As a requirement under the ESA, Federal agencies must provide documentation that ensures that agency actions do not adversely affect the existence of any threatened or endangered species. The ESA requires that all Federal agencies avoid "taking" threatened or endangered species (which includes jeopardizing threatened or endangered species habitat). Section 7 of the ESA establishes a consultation process with USFWS that ends with USFWS concurrence or a determination of the risk of jeopardy from a Federal agency project.

The level of impacts on wetland resources is proportional to the functions and values of the wetland complex. Wetlands function as habitat for plant and wildlife populations, including threatened and endangered species that depend on wetlands for their survival. Wetlands are valuable to the public for flood mitigation, storm runoff abatement, aquifer recharge, water quality improvement, and aesthetics. On a global scale, wetlands are important factors in the nitrogen, sulfur, and carbon cycles. These parameters vary from year to year or from season to season. Quantification of wetlands functions and values, therefore, is based on the ecological quality of the site as compared

with similar sites, and the comparison of the economic value of the proposed activity that would modify it.

4.8.2 Proposed Action

Wright-Patterson AFB has been extensively altered over time and the project area is permanently disturbed with existing facilities and paved roads. Therefore, there would be no adverse effects on the biological resources resulting from implementation of the Proposed Action.

Vegetation. Proposed construction activities to support the beddown of the C-5 aircraft at Wright-Patterson AFB would occur solely within the improved areas of the Base. There are no naturally occurring vegetation communities within the ROI of the construction activities. Land disturbing activities associated with construction and demolition are limited to lawn and landscaped areas. Affected areas would be mulched and revegetated with native plants following the construction and demolition period to prevent nonnative, invasive plant growth. Short-term, localized minor effects on vegetation could be expected in proximity to the construction and demolition sites. Therefore, minor adverse effects would be expected as a result of the implementation of the Proposed Action at Wright-Patterson AFB.

Wildlife. Wildlife habitat within the improved areas of the Base is limited due to fragmentation by the existing facilities, roads, and impervious surfaces at Wright-Patterson AFB. Furthermore, most of the area associated with the Proposed Action consists of disturbed, landscaped, paved, or mowed lands. Construction activities would not impact habitat available to the mammals, birds, or herptiles that occur at Wright-Patterson AFB. This assessment is based on the limited extent of areas that would be affected by the Proposed Action.

Potential effects on wildlife are also a function of noise produced by aircraft operations (see also Section 3.2.1). Predictors of wildlife response include prior experience with overflights, aircraft approach distance, stage in the breeding cycle, activity or context, age, and sex composition. Previous experience with similar overflights is the most important of these indicators. The rate of habituation to aircraft overflights is not known. However, the maximum sound level projected for the aircraft operations within all of the training areas that are part of the Proposed Action would be less than current conditions (see Section 4.2). Therefore, no adverse effects on wildlife would be expected to result from the Proposed Action.

Threatened and Endangered Species. As previously mentioned, there are several Federal- and state-listed threatened or endangered species; as well species of concern, candidate species, and potentially threatened species; that have the potential to occur in proximity to the proposed construction and demolition project area. Short-term noise created during construction and demolition activities to support the C-5 basing is not likely to affect threatened or endangered species due to the proximity of construction activities to these species. No construction activities would occur within areas where threatened or endangered species have been documented or within their potential habitat. Therefore, there would be no effect on threatened or endangered species; or species of concern, candidate species, and potentially threatened species; as a result of the construction associated with the Proposed Action on Wright-Patterson AFB.

The foregoing observations concerning aircraft overflights apply equally to wildlife listed as threatened or endangered. Effects on threatened and endangered species as a result of the use of the C-5 within the study area would not be expected due to the decreased noise levels associated with the C-5 aircraft. The Proposed Action is not likely to jeopardize the continued existence of Federal- or state-listed threatened and endangered species on or in proximity to Wright-Patterson AFB. Therefore, no adverse effects on threatened and endangered species would be expected as a result of the Proposed Action at Wright-Patterson AFB.

In a letter dated February 24, 2004 (included in Appendix A), the USFWS concurs that no federally threatened or endangered species would be impacted by the Proposed Action because of the improved landscape on which the action would occur (Knapp 2004). However, if there are any trees exhibiting characteristics favorable to the Indiana bat in the project area (refer to Section 3.8.2), USFWS recommends those trees and surrounding trees be preserved. USFWS also notes that the clubshell mussel (federally endangered) and eastern massasauga rattlesnake (candidate species) are within the range of the project area, but the nature of the Proposed Action would have no effect on these species (Knapp 2004).

Wetlands. Construction activities at Wright-Patterson AFB would not occur within the vicinity of the jurisdictional wetlands identified on the Base. Therefore, no effects on wetlands are expected at Wright-Patterson AFB as a result of the Proposed Action.

4.9 Cultural Resources

4.9.1 Evaluation Criteria

Adverse impacts on cultural resources might include physically altering, damaging, or destroying all or part of a resource; altering characteristics of the surrounding environment that contribute to the resource's significance; introducing visual or audible elements that are out of character with the property or alter its setting; neglecting the resource to the extent that it deteriorates or is destroyed; or the sell, transfer, or lease of the property out of agency ownership (or control) without adequate legally enforceable restrictions or conditions to ensure preservation of the property's historic significance.

4.9.2 Proposed Action

The most relevant impacts on cultural resources at Wright-Patterson AFB would be related to the direct impacts from building alteration, demolition, and ground-disturbing activities.

There are no known potential prehistoric or historic site locations in the areas where ground-disturbing activities are planned. The areas are not considered to have a high sensitivity for cultural resources. Furthermore, the area has suffered heavy disturbance in the past.

There is no potential for degradation of the setting from noise and visual intrusion related to the construction activities or aircraft operations proposed in this EA, nor are there potential for structural damage from noise and low-frequency sound vibrations associated with the construction activities or aircraft operations.

No NRHP-eligible or potentially eligible districts or landscapes are within the APE for the Proposed Action. Therefore historic districts or landscapes would not be affected by the Proposed Action.

Only one of the structures affected by construction associated with the Proposed Action is considered eligible for the NRHP, Building 152. Modifications to the interior of the building would be necessary to accommodate the C-5 simulator. An IICEP letter was sent to the Ohio SHPO on January 20, 2004. The SHPO responded in a letter dated March 15, 2004, with concerns that the modifications would not conform to the *Secretary of the Interior's Standards for Rehabilitation and Guidelines for Rehabilitating Historic Structures*, which might result in an adverse effect on Building 152's NRHP eligibility. The 88 ABW initiated formal consultation with the SHPO under Section 106 of the NHPA on April 2, 2004, stating a conditional determination of no adverse effect. A reply from the Ohio SHPO, dated June 24, 2004, concurred with a finding of no adverse effect provided that USAF

submit all standard project documentation, including plans, specifications, and photographs, to the Ohio SHPO for review and approval prior to taking action. All coordination with the Ohio SHPO is provided in Appendix D.

4.10 Socioeconomics and Environmental Justice

4.10.1 Evaluation Criteria

Elements of the Proposed Action include ten construction projects (see Table 2-2) and changes in the number of military, USAF civilian, and contractor personnel. The level of construction expenditure impacts is assessed in terms of direct effects on the local economy and related effects on other socioeconomic resources (e.g., housing). The magnitude of potential impacts can vary greatly, depending on the location of a proposed action. For example, implementation of an action that creates ten employment positions might be unnoticed in an urban area, but might have adverse impacts in a rural region. If potential socioeconomic changes were to result in substantial shifts in population trends or in adverse effects on regional spending and earning patterns, they would be considered adverse.

This section identifies potential economic and social impacts that might result from the Proposed Action. The methodology for the economic impact assessment is based on the Economic Impact Forecast System (EIFS) developed by the DOD in the 1970s to efficiently identify and address the regional economic effects of proposed military actions (EIFS 2001). EIFS provides a standardized system to quantify the impact of military actions, and to compare various options or alternatives in a standard, nonarbitrary approach. The EIFS assesses potential impacts on four principal indicators of regional economic impact: business volume, employment, personal income, and population. As a "first tier" approximation of effects and their significance, these four indicators have proven very effective. The methodology for social impacts is based on the Guidelines and Principles for Social Impact Assessment, developed by an interorganizational committee of experts in their field (NOAA 1994). Finally, this section also evaluates environmental justice concerns to include disproportionate impacts on low-income or minority populations.

The Proposed Action at Wright-Patterson AFB would have an adverse impact with respect to the socioeconomic conditions in the surrounding MSA if it would

- Change the local business volume, employment, personal income, or population that exceeds the MSA's historical annual change.

- Negatively affect social services or social conditions, including property values, school enrollment, county or municipal expenditures, or crime rates.
- Disproportionately impact minority populations or low-income populations.

4.10.2 Proposed Action

Social and Economic Condition. Aircraft operation activities already exist at Wright-Patterson AFB and the Proposed Action involves the net gain of 173 personnel. The additional personnel to support the C-5 aircraft operations would increase the amount of personnel by less than one percent. Therefore, the increased number of personnel at Wright-Patterson AFB resulting from the Proposed Action is expected to have a negligible effect on the local workforce.

Construction costs associated with the Proposed Action are estimated to be $99.3 million through March 2008, which would have a direct, beneficial impact on the local economy (EIFS 2004). Construction workers would primarily be drawn from the local workforce, resulting in a short-term, beneficial direct impact on the local economy. Census data for the MSA found 24,578 employees working in the construction industry in 2000 (Bureau of Census 2000a). The number of construction workers required for the proposed construction projects is relatively small compared to the available work force in the MSA, and should be adequate without impacting local employment. Indirect effects from the estimated 3-year construction phase would generate an additional $83.5 million from the purchase of construction materials and related supplies and services from local suppliers (EIFS 2004).

Indirect effects are expected to be short-term and beneficial to local employment and the local economy. The Proposed Action should have no permanent or long-term effects on employment, population, personal income, poverty levels, or other demographic or employment indicators in the Dayton–Springfield MSA. Each job created at a USAF base indirectly generates additional jobs within the region, due to the many companies that supply goods and services to the base and to support base personnel. Therefore, the Proposed Action is estimated to indirectly create an additional 380 jobs in the area (EIFS 2004). The number of new jobs created directly and indirectly by the Proposed Action would represent an increase of about 1.0 percent of the Dayton–Springfield MSA workforce.

Changes in economic factors can also affect the social fabric of a community. For example, increases in employment could stimulate the need for new housing units, and, as a result, increase demand for community and social services such as primary and secondary education, fire and police protection, and health care. The Proposed Action should not stimulate changes in population size or distribution and would minimally increase employment and the local economy. Demand for new housing units

and other social services should not be affected. Construction or development projects can also affect social conditions if they involve a change in land use or development of previously undeveloped or "open" spaces. The Proposed Action does not involve changes in land use or new development; therefore, no impacts on social conditions are anticipated.

Environmental Justice. As discussed in Section 3.10.1, the USAF has issued guidance on Environmental Justice analysis. To comply with EO 12898, ethnicity and poverty status in the study area have been examined and compared to state and national statistics to determine if minority or low-income groups could be disproportionately affected by the Proposed Action. The review indicates that residents living within Census Bureau Tract 2001, 2002, and 2007 have a lower per capita income, a higher unemployment rate, and a higher percentage of residents living below the poverty level than county or state averages (Bureau of Census 2000a). The review also indicates that the percentage of minority residents is somewhat higher than county or state averages.

Potential adverse effects from the new construction activities would occur on the Base, with no adverse effects anticipated off-Base. The environment around Wright-Patterson AFB is influenced by USAF operations, land management practices, vehicle traffic, and emissions sources outside the Base. Increased traffic from construction activities would affect local air quality, but the effects would be dispersed and affect area residents and Base employees equally. The construction and demolition projects would be performed by outside contractors with employees living within Greene County and the ROI. Long-term economic benefits would be minimal since the Proposed Action would require 173 additional personnel at Wright-Patterson AFB. No disproportionate effects on minority or low-income populations from the Proposed Action were identified.

Indirect effects from the Proposed Action would generate an additional $14 million from the purchase of construction materials and related supplies and services from local businesses (EIFS 2004). Indirect effects are expected to be short-term and beneficial to local employment and the local economy. Each job created at a USAF base generates additional jobs within the region due to the many companies that supply goods and services to the installation and to support Base personnel. The Proposed Action is projected to indirectly create approximately 380 jobs in the area. The number of new jobs that would be created directly and indirectly by the Proposed Action represents less than 1.0 percent of Dayton's workforce (EIFS 2004). The Proposed Action should have no permanent or long-term effects on population, personal income, poverty levels, or other demographic or employment indicators in the Dayton, Ohio, area.

In addition, EO 13045 requires that Federal agencies identify and assess environmental health and safety risks that might disproportionately affect children. The Proposed Action would not likely pose any adverse or disproportionate environmental health or safety risks to children living in the vicinity of the Base. The likelihood of the presence of children at the site where the Proposed Action would occur on Base is considered minimal, which further limits the potential for effects. Therefore, no adverse effects would be expected.

4.11 Infrastructure

4.11.1 Evaluation Criteria

Impacts on infrastructure are evaluated for their potential to disrupt or improve existing levels of service and additional needs for energy and water consumption, sanitary sewer systems, and transportation patterns and circulation. Impacts might arise from physical changes to circulation, construction activities, introduction of construction-related traffic on local roads or changes in daily or peak-hour traffic volumes, and energy needs created by either direct or indirect workforce and population changes related to Base activities.

4.11.2 Proposed Action

Transportation Systems. There would be a temporary increase in use of the Base's roadways as a result of construction traffic. Construction equipment would be driven to the project locations and would be kept on site during the duration of the project. All damaged Base transportation infrastructure from construction activities on the Base would be repaired.

The number of personnel supporting the C-5 mission would increase as a result of the Proposed Action. The increase of 173 personnel is minor in comparison to the approximately 13,000 personnel currently working at Wright-Patterson AFB. Therefore, negligible effects on transportation systems would be expected under the Proposed Action.

Electrical Power. The Proposed Action would result in a net change in the electrical power system due to the increase in personnel. The electrical power system at Wright-Patterson AFB is designed to accommodate a Base population that is approximately 50 percent larger. Therefore, negligible effects on the electrical power would be expected under the Proposed Action.

Natural Gas. The Proposed Action would result in a net increase of personnel and use of the natural gas system. However, this would be a negligible increase in the demand for natural gas. Therefore, negligible effects on natural gas demand would occur as a result of the Proposed Action.

Liquid Fuels. Under the Proposed Action, the liquid fuels system would be upgraded to accommodate the C-5 aircraft. Motorized equipment and vehicle operations are estimated to remain nearly unchanged under the Proposed Action. Therefore, there would be negligible effects on the liquid fuels system as a result of the Proposed Action.

Water Supply. The Proposed Action would result in a net increase of personnel and use of the water supply system. However, this would be a negligible increase in the demand for water. Therefore, there would be no adverse effects on the water supply system as a result of the Proposed Action.

Pollution Prevention. It is anticipated that the Proposed Action would not affect the Pollution Prevention Program at Wright-Patterson AFB. Quantities of hazardous material and chemical purchases, off-Base transport of hazardous waste, disposal of MSW, and energy consumption would continue. Operation of the C-5 aircraft at Wright-Patterson AFB would require procurement of products containing hazardous materials, generation of hazardous waste, and consumption of energy consistent with the baseline condition associated with the operation of the C-141C aircraft (refer to Section 4.12.2 for further information on quantities of hazardous materials at Wright-Patterson AFB). The Pollution Prevention Program at Wright-Patterson AFB would accommodate the Proposed Action though improvements will be made to the current storm water system, specifically improvements to the containment and capture of deicing fluid, regardless of implementation of the Proposed Action. Currently, approximately 4,000 gallons of deicing fluid is containerized via a mobile Tennant 1550 vacuum unit and discharged to the Fairborn treatment plant. This amount would increase if more fluid is contained and sent to the treatment plant. The method for containerizing at least 60 to 80 percent of deicing fluid used, and the subsequent disposal of the captured deicing fluid must be addressed by the 88 ABW and 445 AW. It is anticipated that the increase in deicing fluid would not affect the Fairborn wastewater treatment plant because the concentration is typically dilute and discharged periodically (Baroski 2004). If the containerized deicing fluid was not so dilute, it would require slower release so that the treatment system is not overburdened.

Solid Waste. In considering the basis for evaluating the level of impacts on solid waste, several items are considered. These items include evaluating the degree to which the proposed construction projects would affect the existing solid waste management program and capacity of the area landfill.

Solid waste generated from the proposed construction activities would consist of building materials such as solid pieces of concrete, metals (conduit, piping, and wiring), and lumber. Contractors are

required to recycle construction and demolition waste to the greatest extent possible as part of Base policy, and any recycled construction and demolition waste would be diverted from landfills. Table 4-5 presents the estimated amount of MSW that would be generated from the Proposed Action.

Analysis of the cumulative impacts associated with implementation of the Proposed Action and other actions is based on the following assumptions (USACE 1976):

- Approximately 4 pounds of construction debris is generated for each square foot of floor area for new structures.
- Approximately 1 pound of construction debris is generated for each square foot of new asphalt.
- Approximately 92 pounds of demolition debris is generated for each square foot of floor area for old structures.

Long term increases in solid waste generation due to the operation of the new facilities and the increase in personnel would be minor. Therefore, the Proposed Action would have a minor, adverse impact on the solid waste management program at Wright-Patterson AFB.

Sanitary Sewer and Wastewater Systems. The Proposed Action would result in a net change in the use of the sanitary sewer system due to the increase in personnel. The sanitary sewer system at Wright-Patterson AFB is designed to accommodate a base population that is approximately 50 percent larger. The Proposed Action would not result in increased use of deicing fluid, which would result in greater discharge to the Fairborn treatment plant (see Section 4.12.2 for quantities of hazardous materials used). Therefore, no impacts on the sanitary sewer system would result because of the Proposed Action.

Heating and Cooling. The Proposed Action would not result in a net change in heating and cooling systems usage. Therefore, no adverse impacts on heating and cooling systems would result from the Proposed Action.

Communications. The Proposed Action would not result in a net change in communications systems. Therefore, no adverse impacts on the communications system would result from the Proposed Action.

Table 4-5. Projected Construction and Demolition Waste Generation

Project No.	Construction Project	New Construction (ft^2)	Asphalt Area (ft^2)	Demolition (ft^2)	Waste (pounds)
1	Alter Airfield Pavement (I)	--	334,998	--	334,998
2	Construct C-5 Scheduled Maintenance Hangar	52,302	--	--	2,969,208
	Demolish Building 4028	--	--	30,000	
3	Construct C-5 Multipurpose Hangar	70,342	--	--	3,609,744
	Demolish Building 4022	--	--	33,056	
	Demolish 4029, 4030, 4031, and 4033	--	--	3,122	
4	Alter Airfield Pavement (II)	--	334,998	--	334,998
6	Alter Maintenance Shops (Hangar 4026)	10,000	--	--	40,000
7	Construct C-5 Fuel Systems Maintenance Hangar	35,160	--	--	140,640
8	Modify Flight Simulator Facility (Building 152)	4,004	--	--	16,016
9	Construct C-5 Squadron Operation Facility	30,600	--	--	122,400
10	Alter Building 4014 for Reserve Training	45,390	--	--	181,560
				Total MSW (pounds)	**7,749,564**
				Total MSW (tons)	**3,875**

4.12 Hazardous Materials and Wastes

4.12.1 Evaluation Criteria

Impacts to hazardous material management would be considered adverse if the Federal action resulted in noncompliance with applicable Federal and state regulations, or increased the amounts generated or procured beyond current Wright-Patterson AFB waste management procedures and capacities.

Impacts on pollution prevention would be considered adverse if the Federal action resulted in worker, resident, or visitor exposure to these materials, or if the action generated quantities of these materials beyond the capability of current management procedures. Impacts on the ERP would be considered adverse if the Federal action disturbed (or created) contaminated sites resulting in negative effects on human health or the environment. Impacts on fuels management would be adverse if the established management policies, procedures, and handling capacities could not accommodate the activities associated with the Proposed Action.

4.12.2 Proposed Action

Hazardous Materials. Products containing hazardous materials would be procured and used during the proposed construction projects and during the operation of the C-5 aircraft. It is anticipated that the quantity of products containing hazardous materials used during the construction of Base facilities would be minimal and their use would be of short duration. Contractors would be responsible for the management of hazardous materials, which would be handled in accordance with Federal and state regulations. Therefore, hazardous materials management at Wright-Patterson AFB would not be impacted by the proposed construction activities.

Conversion to the C-5 aircraft would result in fewer airframes (16 C-141C PAA to 10 C-5 PAA) and fewer aircraft operations (53.7 percent). The C-5 is larger than the C-141C, so it would have a greater surface area. However, hazardous materials used would not be expected to increase dramatically, if at all, including deicing fluid. As discussed in Sections 3.7.2 and 4.7.2, the 88 ABW is required to sample for glycol under the revised NPDES permit. It is important that the Proposed Action not exacerbate the existing problem with deicing fluid running off into Bass Lake and the Mad River. In 2003, the 439 AW at Westover ARB used 16,000 gallons of pure deicing fluid for 16 C-5 PAA aircraft, which is approximately 1,000 gallons per year per C-5 airframe (Moriarty 2004). The 445 AW would have 10 C-5 PAA aircraft under the Proposed Action. Westover ARB has more freezing days and precipitation during winter months (November through March) than Wright-Patterson AFB, so it is reasonable to assume that Westover ARB uses deicing fluid more often than Wright-Patterson

AFB. Therefore, it is anticipated that under the Proposed Action, the 445 AW would use approximately 10,000 gallons per year deicing fluid or less (1,000 gallons multiplied by 10 C-5 aircraft). The 445 AW currently uses 10,000 gallons per year, so there would be minimal change, if any, from the baseline under the Proposed Action. Improvements for containing and collecting deicing fluids will be made, regardless of the Proposed Action, as a result of the changing NDPES permit, but these improvements have not been identified at this time.

Should the proposed basing of C-5 aircraft occur at Wright-Patterson AFB, it is anticipated that procurement of products containing hazardous materials would be comparable to those used for the C-141C due to the similarity of the maintenance and support activities for the two aircraft. Additionally, the proposed number of C-5 aircraft is less than the number of C-141C aircraft that are being reassigned or retired from Wright-Patterson AFB. Therefore, it is estimated that hazardous material procurement would remain comparable to the baseline condition. USAF is pursuing aircraft maintenance procedures that would use fewer hazardous materials. As the procedures are developed, it is likely that the quantity of hazardous materials required for C-5 maintenance activities would decrease. Therefore, there would be no impact on hazardous materials management at Wright-Patterson AFB.

Hazardous Wastes. It is anticipated that the quantity of hazardous wastes generated from proposed construction activities would be negligible. Contractors would be responsible for the disposal of hazardous wastes in accordance with Federal and state laws and regulations. Construction of the proposed facilities would not impact the Base's hazardous waste management program.

The number of C-5 aircraft that would operate under the Proposed Action would be less than the baseline condition. Therefore, it is anticipated that the volume, type, classifications, and sources of hazardous wastes associated with the Proposed Action would be similar in nature with the baseline condition waste streams. Hazardous waste would be handled, stored, transported, disposed of, or recycled in accordance with the Wright-Patterson AFB Hazardous Waste Management Plan. If fewer hazardous materials are used for C-5 aircraft maintenance, the quantity of hazardous wastes generated would decrease.

Asbestos-Containing Material and Lead-Based Paint. Specifications for the proposed construction activities and USAF regulations prohibit the use of ACM and LBP for new construction. All of the facilities that surround the proposed project area of the 445 AW contain both ACM and LBP.

Demolition and modification activities would be handled in accordance with the Asbestos Management Plan, LBP Management Plan, and USAF policy.

Environmental Restoration Program. Six of the renovation, demolition, and construction projects would be located within OU 11 (see Figure 4-5). In 1996, a field investigation showed no significant risk in OU 11 and, in September 1998, a Record of Decision, No Further Action was signed. Three of the construction projects (alter Building 4014 for Reserve Training, construct C-5 Maintenance Hangar, and alter Maintenance Shops) are located near ERP Site Chemical Disposal Area. The wastes reportedly disposed of in the Chemical Disposal Area were ammonia cleaning solutions, paint remover, and aircraft washing chemicals. Based on the results of soil contamination investigations at the Chemical Disposal Area, it was determined that the site posed no significant risk or threat to public health or the environment (Siegal 2004). As such, it is unlikely that contamination would be encountered during these construction activities; however, should contamination be encountered, the handling, storage, transportation, and disposal activities would be conducted in accordance with applicable Federal, state, and local regulations; AFIs; and Wright-Patterson AFB policies.

The alteration of the Flight Simulator Facility is located within OU 2. The only environmental regulations for this OU are natural attenuation for Spill Sites 2, 3, and 10. The wastes reported for Spill Sites 2, 3, and 10 included benzene, toluene, ethylbenzene, and xylene; jet petroleum; and other hydrocarbons (Siegal 2004). The renovation would not occur near those sites. As part of Wright-Patterson AFB's groundwater long-term monitoring program, there is a cluster of three flush-mounted monitoring wells, near Building 125, the Flight Simulator Facility (Ehret 2004). Flush-mounted wells are even with the ground surface, so damage would likely only occur during ground-disturbing activities. Alterations to the building would be internal and should not affect the monitoring wells. However, the 88 ABW would take necessary precautions to avoid the monitoring wells while moving construction equipment to ensure that they would not be damaged. If a well were damaged, the necessary procedures to plug and abandon the well properly would be followed. An equivalent replacement well would also be installed.

4.13 No Action Alternative

Under the No Action Alternative, the strategic airlift mission of the 445 AW at Wright-Patterson AFB would continue until the remaining C-141C aircraft are retired or their useful life is extended. C-5 aircraft replacement would not occur. C-141C operations would continue flying until the scheduled drawdown is complete in FY 06. By that time, the C-141 might no longer be able to be supported by

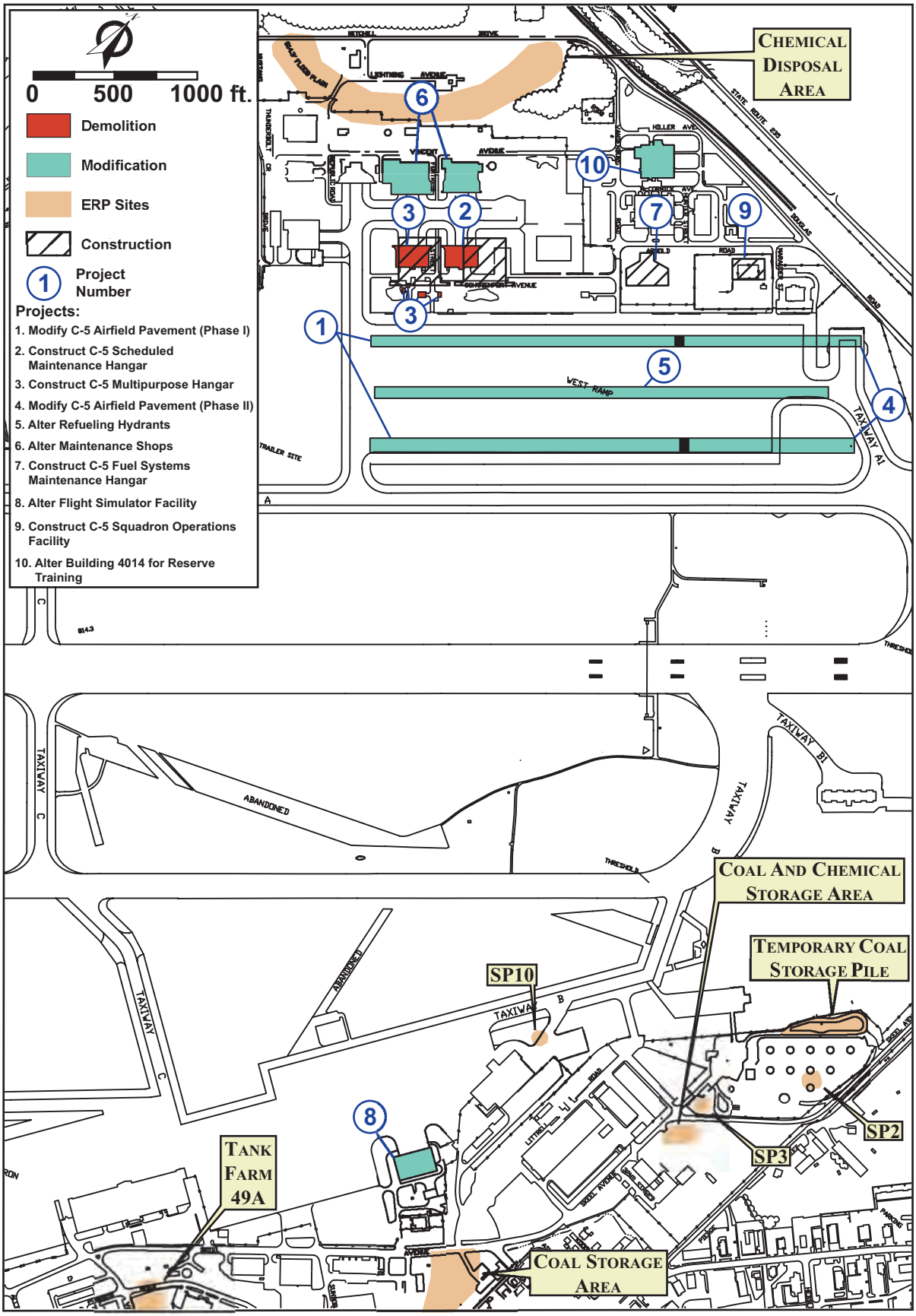

Figure 4-5. Locations of ERP Sites and Proposed Construction at Wright-Patterson AFB

spare parts, and the C-141C fleet at Wright-Patterson AFB would be retired. All other missions operating at Wright-Patterson would remain. AFRC would continue to support airlift missions using other airlift assets. These missions would require increased flying time to compensate for the lost capability once supported by the 445 AW at Wright-Patterson AFB.

Noise. As C-141C aircraft are retired, overall noise would decrease. Once drawdown is complete in the third quarter of FY 06, there would be no C-141C aircraft, which would result in less noise in and around Wright-Patterson AFB.

Air Quality. As C-141C aircraft are retired, there would be an overall reduction in the operation, activities, and use of facilities, buildings, and equipment at the Base. As a result, regulated pollutant emissions from flight operations, AGE, external combustion devices, surface coating, fuel-handling activities, and construction would decrease from current levels.

Socioeconomics and Environmental Justice. Under the No Action Alternative, the 445 AW would no longer have a mission following completion of the C-141C drawdown at Wright-Patterson AFB. The 445 AW would either have to have a new mission assignment at the Base, or they would be assigned a new mission at another base. Loss of personnel would be an adverse impact of the No Action Alternative.

Infrastructure. Under the No Action Alternative, there would be no change in baseline conditions and none of the proposed construction projects would occur. Therefore, there would be no impact on Wright-Patterson AFB's infrastructure. However, the amount of all types of fuel used at Wright-Patterson AFB would be reduced due to the drawdown of the C-141C aircraft.

Hazardous Materials and Wastes. Under the No Action Alternative, hazardous waste generation would decrease due to the planned drawdown of C-141C aircraft. In addition, procurement of products containing hazardous materials would decrease due to the continuing retirement of C-141C aircraft from Wright-Patterson AFB. With fewer and fewer maintenance activities occurring at the Base, the requirement for products containing hazardous materials would decrease.

The No Action Alternative would have no effect on safety, or geological, water, biological, or cultural resources.

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5. Cumulative and Adverse Impacts

Cumulative impacts on environmental resources result from incremental effects of proposed actions, when combined with other past, present, and reasonably foreseeable future projects in the area. Cumulative impacts can result from individually minor, but collectively substantial, actions undertaken over a period of time by various agencies (Federal, state, and local) or individuals. Informed decisionmaking is served by consideration of cumulative impacts resulting from projects that are proposed, under construction, recently completed, or anticipated to be implemented in the foreseeable future.

5.1 Description of Other Actions

Type III Pressurized Hydrant Fueling System. Construction of a Type III pressurized hydrant fueling system is anticipated in the immediate West Ramp area of Wright-Patterson AFB (see Figure 5-1). This project would involve replacing the current Type II pump house with a Type III pressurized hydrant fueling system and installing two 400,000-gallon ASTs. The Type III hydrant system project would include

- Pre-engineered metal pump house
- Pump room with five 38-liters-per-second pumps
- Control room
- Restroom facilities
- Automated pump control
- Cathodic protection
- Underground product recovery tank
- Hydrant Service Vehicle check out station
- Emergency power generator

The hydrant loop would originate at the new pump house and connect to existing piping at the apron. The underground piping on the West Ramp has been replaced, upgraded, and sized to be compatible and comply with the Type III system. The hydrant fueling system would be able to fuel and defuel at 151 liters per second.

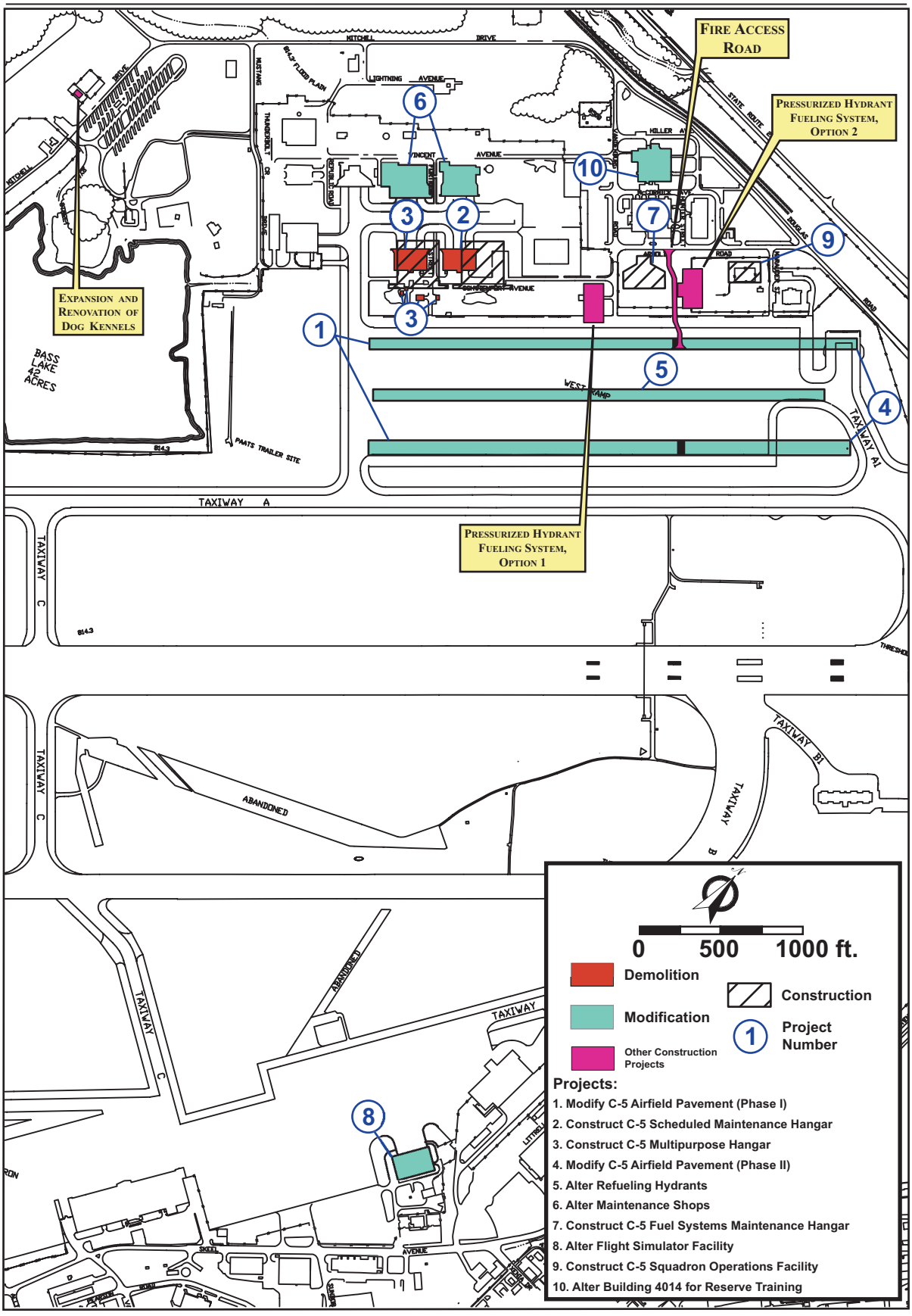


Figure 5-1. Proposed Construction and Other Construction Projects in the ROI at Wright-Patterson AFB

The total footprint would be 8,610 ft^2 (800 m^2). The small, current Type II pump house structures would be demolished (Buildings 4030, 4032, and 4033) to accommodate the C-5 Proposed Action as part of Project 3, the C-5 multipurpose hangar. Two ASTs would be installed, each with a 400,000-gallon capacity. Secondary containment would be impervious to oil and designed to hold the maximum capacity of the tank and additional rainwater, in accordance with the Wright-Patterson AFB Spill Prevention Control and Countermeasures Plan (88 ABW/EM 2003). A permit to install would be necessary. The Type III pressurized hydrant fueling system would comply with all USAF system standards, including environmental protection requirements, such as automatic leak detection, spill containment trenches, and emergency shut-offs to prevent releases to the environment. The underground product recovery tank would have double-walled piping and construction to protect against environmental damage.

Eight 50,000-gallon USTs would also be removed, four of which are inactive and abandoned in place. Unneeded piping between the old pump houses would also be removed. Soil sampling would be done to confirm that no leaks occurred from the USTs or piping. A permit to remove would be necessary. Total demolition area would be 2,970 ft^2 (276 m^2). The Type III fueling system would address mission, safety, infrastructure, and environmental concerns and compliance associated with the much older Type II system. The expected project timeline would be from July 2006 to October 2006. As shown in Figure 5-1, there are two siting options for the Pressurized Hydrant Fueling System.

Engine Run/Deicing Pad. Preliminary plans for an engine run/deicing pad might be near the Proposed Action, but the exact location is undetermined at this time. The engine run/deicing pad would likely be constructed during the second phase of the modifications to the parking apron (Project 4 of the Proposed Action) in FY 06. This pad would contain a greater amount of deicing fluids used, as well as potential leaks from aircraft. Oil and water separators would be part of the design. However, the engine run/deicing pad is not a part of this Proposed Action, and no final decision has been made about schedule for and location of this project. In the interim, as discussed in Sections 3 and 4, deicing fluids will be contained via an undetermined method from C-141C deicing and future C-5 deicing.

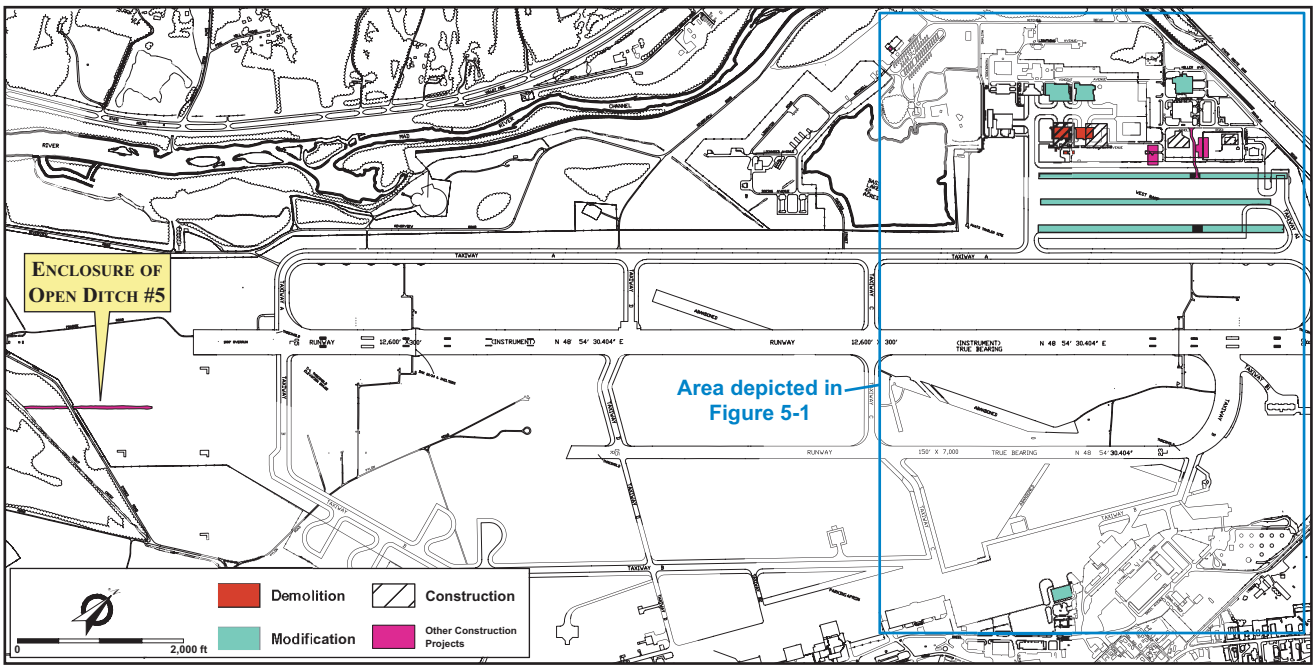
Implementation of the Capital Investment Program. According to the 2003 *Capital Investment Program* for Wright-Patterson AFB, other construction projects for Wright-Patterson AFB might occur over the next few years during the proposed C-5 program construction (WPAFB 2003). Two of these projects are considered to be of high interest and are forecasted to occur when the proposed C-5

construction would occur: a Consolidated Fire/Crash Rescue Station and the Information Technology Complex (Phase I of a two-phase project). The Consolidated Fire/Crash Rescue Stations would replace two inadequate fire stations in Areas A and C. The anticipated new fire station would be approximately 35,725 ft^2 (3,320 m^2) and located to ensure the quick and safe entry and exit for responding fire trucks. A Fire Access Road (see Figure 5-1) is anticipated around August 2007. The road is estimated to be approximately 13,442 ft^2 (1,250 m^2).

Phase I of the Information Technology Complex would be 105,835 ft^2 (9,830 m^2) of construction in Area B of Wright-Patterson. If constructed, it would provide critical, secure computer and engineering modeling functions in a single facility. Both the Fire/Crash Rescue Station and the Information Technology Complex would be built in FY 06, if military construction money is appropriated for these projects. These projects, should they be constructed as anticipated in the *Capital Investment Program*, are not expected to result in any cumulative impacts associated with the Proposed Action.

Enclosure of Open Ditch No. 5. Based on a comparison of bird aircraft strike data from years 1995 through 2002 provided by the Flight Safety Office at Wright-Patterson AFB, bird aircraft strikes have decreased since the implementation of the depredation measures and pyrotechnic activities. However, there are still enough bird aircraft strikes to warrant additional measures to help control the BASH threat. An expansive open ditch (identified as Open Ditch No. 5) is located near the southwest side of the main runway in Area C and attracts various species of birds to the area (see Figure 5-2). The project area lies within the 100 year floodplain elevation of 814.3 feet MSL. Construction activities from the Proposed Action would include removal of existing soils within the ditch, placement of the culvert and filling in and around the culvert with the excavated soils. The MCD controls the flood protection system in the Great Miami River Watershed and has the right to back water on and over the property upstream of Huffman Dam. MCD policies would be followed. Any additional fill that may be required would be obtained from within the same floodplain basin to realize a net zero net increase of fill material within the 100 year floodplain. Therefore, impacts due to loss or gain of soils within the retention basin are expected to be minimal. As such, this action when combined with the Proposed Action and the other actions proposed for Wright-Patterson AFB would result in no cumulative impacts to the 100-year floodplain.

Expansion and Renovation of Dog Kennels. Wright-Patterson AFB identified the need to expand and renovate the existing dog kennels located in Building 34053 due to the increase in mission



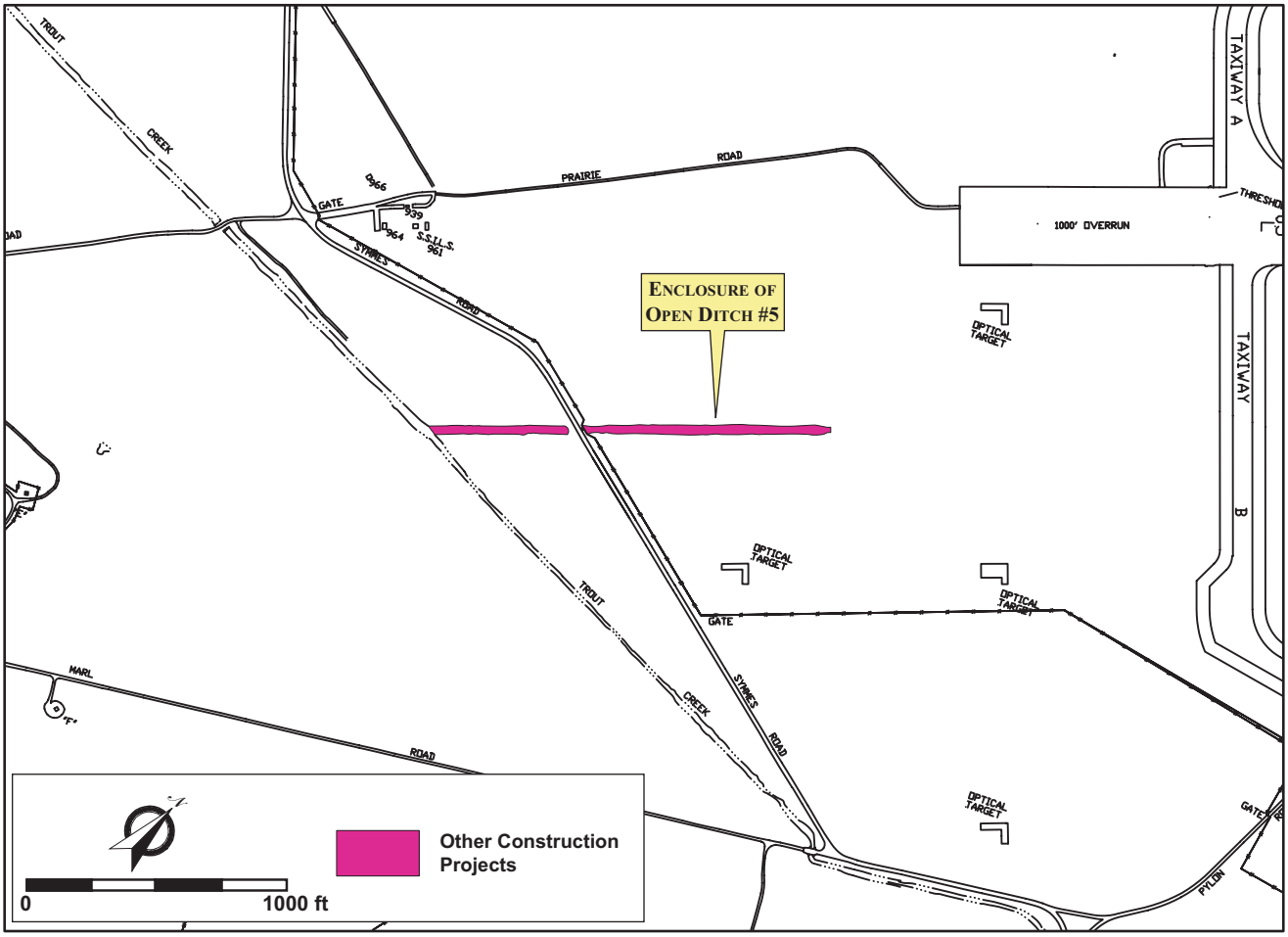


Figure 5-2. Location of Enclosure of Open Ditch No. 5 Project on Wright-Patterson AFB

requirements. The project area is north of and adjacent to the Bass Lake Recreational Area and lies within the 100 year floodplain elevation of 814.3 feet MSL (see Figure 5-1). Construction activities from the Proposed Action would include removal of existing soils in the area planned for expansion around Building 34053 and filling in and around the expansion area with the excavated soils. The MCD controls the flood protection system in the Great Miami River Watershed and has the right to back water on and over the property upstream of Huffman Dam. MCD policies would be followed. Any additional fill that may be required would be obtained from within the same floodplain basin to realize a net zero net increase of fill material within the 100 year floodplain. Therefore, impacts due to loss or gain of soils within the retention basin are expected to be minimal. As such, this action when combined with the Proposed Action and the other actions proposed for Wright-Patterson AFB would result in no cumulative impacts to the 100-year floodplain.

5.2 Unavoidable Adverse Impacts

Unavoidable adverse impacts would result from implementation of the Proposed Action.

Noise. The noise resulting from anticipated aircraft operations is an unavoidable condition. The C-5 is a larger, louder aircraft than the C-141C; however, the overall noise environment would decrease because of fewer aircraft and aircraft operations. Noise is not considered an adverse impact.

Geological Resources. Under the Proposed Action, construction activities, such as grading, excavating, and recontouring of the soil, would result in soil disturbance. Implementation of BMPs during construction would limit potential impacts resulting from construction activities. Standard erosion control means would also reduce potential impacts related to these characteristics.

Biological Resources. Site grading associated with construction projects would remove minimal vegetation and associated small animal life now occupying and utilizing the affected acres. All of the affected sites are in the area of the Base that is classified as industrial use, and are already heavily disturbed. This area does not presently provide suitable habitat for many species.

Safety. The potential for aircraft mishaps, the potential for accidents or spills at the fuel storage facility, and the generation of hazardous wastes are unavoidable conditions associated with the Proposed Action. However, the potential for these unavoidable situations would not dramatically increase over baseline conditions.

Energy. The use of nonrenewable resources is an unavoidable occurrence, although this use is negligible compared with total use of energy. The Proposed Action would require the use of fossil

fuels, a nonrenewable natural resource. Energy supplies, although relatively small, would be committed to the Proposed Action or No Action Alternative.

5.3 Compatibility of the Proposed Action and Alternatives with the Objectives of Federal, Regional, State, and Local Land Use Plans, Policies, and Controls

Impacts on the ground surface as a result of the Proposed Action would occur entirely within the boundaries of Wright-Patterson AFB. Construction of new facilities and modification to existing facilities would not result in any adverse or incompatible land use changes on or off the Base. The basing and operation of C-5 aircraft would not alter the relationships of the general land use areas that have been designated in the base-planning guidance documents. The land use categories incorporate developed and undeveloped lands. These land use designations were established to segregate aircraft facilities from other military base support areas. Facilities planned for the C-5 operations have been sited according to these existing land use zones. Consequently, development of C-5 facilities would not be in conflict with base land use policies or objectives. The Proposed Action would not conflict with any applicable off-Base land use ordinances or designated CZs.

5.4 Relationship Between the Short-term Use of the Environment and Long-term Productivity

Short-term uses of the biophysical components of man's environment include direct construction-related disturbances and direct impacts associated with an increase in population and activity that occur over a period of less than 5 years. Long-term uses of human environment include those impacts occurring over a period of more than 5 years, including permanent resource loss.

Several kinds of activities could result in short-term resource uses that compromise long-term productivity. Filling of wetlands or loss of other especially important habitats and consumptive use of high-quality water at nonrenewable rates are examples of actions that affect long-term productivity.

The Proposed Action would not result in intensification of land use at Wright-Patterson AFB or the surrounding area. Development of the Proposed Action would not represent a loss of open space. Therefore, it is anticipated that the Proposed Action would not result in any cumulative land use or aesthetic impacts. Long-term productivity of this site would be increased by the implementation of the Proposed Action.

5.5 Irreversible and Irretrievable Commitments of Resources

The irreversible environmental changes that would result from implementation of the Proposed Action involve the consumption of material resources, energy resources, land, biological habitat, and human resources. The use of these resources is considered to be permanent.

Irreversible and irretrievable resource commitments are related to the use of nonrenewable resources and the effects that use of these resources will have on future generations. Irreversible effects primarily result from use or destruction of a specific resource that cannot be replaced within a reasonable time frame (e.g., energy and minerals).

Material Resources. Material resources used for the Proposed Action include building materials (for construction of facilities), concrete and asphalt (for roads), and various material supplies (for infrastructure). Most of the materials that would be consumed are not in short supply and would not limit other unrelated construction activities.

Energy Resources. Energy resources used for the Proposed Action would be irretrievably lost. These include petroleum-based products, such as gasoline, jet fuel, diesel, natural gas, and electricity. During construction, gasoline and diesel would be used for the operation of construction vehicles. During operation, gasoline would be used for the operation of private and government-owned vehicles. Natural gas and electricity would be used by operational activities. Consumption of these energy resources would not place an overburdening demand on their availability in the region.

Biological Habitat. The Proposed Action would not result in the loss of vegetation or wildlife habitat on proposed construction sites. Proposed construction is occurring on already disturbed land that is classified as industrial use. Furthermore, the Proposed Action would not remove open space or undeveloped land currently functioning as biological habitat.

Human Resources. The use of human resources for construction and operation is considered an irretrievable loss, only in that it would preclude such personnel from engaging in other work activities. However, the use of human resources for the Proposed Action represents employment opportunities, and is considered beneficial.

6. List of Preparers

This EA has been prepared under the direction of the HQ AFRC and Wright-Patterson AFB. The individuals who contributed to the preparation of this document are listed below.

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B.A. History
Years of Experience: 5

Louise Baxter
e^2M
M.P.A. Public Administration
B.S. Political Science
Years of Experience: 3

Suanne Collinsworth
e^2M
M.S. Environmental Sciences and Engineering
B.S. Geology
Certificate of Water Quality Management
Years of Experience: 6

Timothy Demorest
e^2M
A.M. Classical Studies
B.A. Classical Studies
Years of Experience: 2

Gustin Hare
e^2M
B.S. Environmental Science
Registered Environmental Professional
Years of Experience: 7

Russ Henning
e^2M
B.S. Mechanical Engineering
Registered Professional Mechanical Engineer, California
Registered Professional Mechanical Engineer, Oklahoma
Years of Experience: 16

Brian Hoppy
e^2M
B.S. Biology
Certificate of Environmental Management
Years of Experience: 14

Ron Lamb
e^2M
M.S. Environmental Science
M.A. Political Science/International Economics
B.S. Political Science
Years of Experience: 18

Sean McCain
e^2M
M.B.A. Business Administration
B.S. Forestry and Natural Resources Management
Years of Experience: 9

Raul Reyes
e^2M
B.A.A.S. Wildlife Biology
Years of Experience: 8

Dan Savercool
e^2M
M.S. Biological Oceanography
B.A. Zoology/Marine Science
A.A.S. Natural Resources Conservation
Certified Senior Ecologist, ESA
Certified Forest Stand Delineator
Years of Experience: 20

Rachel Schneider
e^2M
B.A. Chemistry with Environmental Studies
Years of Experience: 4

Lauri Watson
e^2M
B.S. Environmental Science
Years of Experience: 2

Mary Young
e^2M
B.S. Environmental Science
Years of Experience: 2

7. References

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APPENDIX A

INTERAGENCY AND INTERGOVERNMENTAL COORDINATION FOR ENVIRONMENTAL PLANNING (IICEP) CORRESPONDENCE AND COMMUNITY INVOLVEMENT

January 20, 2004

Mr. Horst Greczmiel
Council on Environmental Quality
360 Old Executive Office Building, NW
Washington, DC 20501

Dear Mr. Greczmiel:

The Air Force Reserve Command is preparing an Environmental Assessment (EA) for the 445th Airlift Wing Conversion from C-141C to C-5 Aircraft at Wright-Patterson Air Force Base, Ohio. engineering-environmental Management, Inc. (e^2M) has been contracted by the Air Force Reserve Command to assist in the preparation of the EA. The Description of Proposed Action and Alternatives (DOPAA), which forms the basis for the analysis to be conducted within the EA, is included with this correspondence as Attachment 1.

The environmental impact analysis process for this proposal is being conducted by the Air Force Reserve Command in accordance with the Council on Environmental Quality guidelines pursuant to the requirements of the National Environmental Policy Act of 1969. In accordance with Executive Order 12372, *Intergovernmental Review of Federal Programs*, we request your participation by reviewing the attached DOPAA and solicit your comments concerning the proposal and any potential environmental consequences. Please provide written comments or information regarding the action at your earliest convenience but no later than February 20, 2004. Also enclosed is a listing of the Federal, state, and local agencies that have been contacted (see Attachment 2). If there are any additional agencies that you feel should review and comment on the proposal, please include them in your distribution of this letter and the attached materials.

Please address questions concerning or comments on the proposal to Mr. Brian Hoppy at e^2M. I can be reached at (610) 649-8064 until January 30, 2004 and at (610) 949-9699 starting February 2, 2004. Please forward your written comments to Mr. Hoppy, in care of e^2M, Inc., 3949 Pender Drive, Suite 120, Fairfax, Virginia, 22030. Thank you for your assistance.

Sincerely,
engineering-environmental Management, Inc.

Brian Hoppy
Program Manager

Attachments:
1. Description of Proposed Action and Alternatives (DOPAA)
2. Distribution List

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Federal Agencies and Points of Contact

The Honorable Mike DeWine
U.S. Senate
140 Russell Senate Office Building
Washington, DC 20510-3503

The Honorable David L. Hobson
U.S. House of Representatives
2346 Rayburn House Office Building
Washington, DC 20515-3507

The Honorable George Voinovich
U.S. Senate
317 Hart Senate Building
Washington, DC 20510-3504

Mr. Horst Greczmiel
Council on Environmental Quality
360 Old Executive Office Building, NW
Washington, DC 20501

Mr. Ralph Thompson
Federal Aviation Administration,
Airport Program (APP600)
800 Independence Ave, SW
Washington, DC 20591

Mr. Don Kilma
Director, Office of Planning and Review
Advisory Council on Historic Preservation
1100 Pennsylvania Ave., NW #809
The Old Post Office Building
Washington, DC 20004

Mr. A. Forester Einarsen
NEPA Coordinator
U.S. Army Corps of Engineers
Office of Environmental Policy (CECW-AR-E)
20 Massachusetts Ave.
Washington, DC 20314-1000

Ms. Ann M. Hooker
Environmental Specialist, NEPA Liaison
Federal Aviation Administration
Office of Environment and Energy (AEE300)
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Washington, DC 20591

Ms. Andree DuVarney
National Environmental Coordinator
U.S. Department of Agriculture
National Resource Conservation Service
14th and Independence Ave., SW
PO Box 2890
Washington, DC 20013

Mr. Rhey Solomon
Director, NEPA Staff
U.S. Department of Agriculture
Forest Service
PO Box 96090
Washington, DC 20090-6090

Mr. Richard Sanderson
Director, Office of Federal Activities
U.S. Environmental Protection Agency
Federal Agency Liaison Division, 2251-A
401 M Street, SW
Washington, DC 20460

Lt. Col Mark Gillette
Air Force Representative
Federal Aviation Administration
Central Region, ASO-910
901 Locust St.
Rm. 565
Kansas City, MO 64106-2641

Mr. Ken Westlake
Environmental Review Coordinator
U.S. Environmental Protection Agnecy,
Region 5
77 West Jackson Blvd.
Chicago, IL 60604-3507

Ms. Cecelia Hunziker
Regional Administrator
Federal Aviation Administration
Great Lakes Region
2300 E. Devon Avenue
Des Plaines, IL 60018

Federal Agencies and Points of Contact continued

Mr. Dain Maddox
Forest Service Region,
Eastern Region
310 West Wisconsin Avenue
Room 580
Milwaukee, WI 53203

Mr. TJ Miller
Chief, Ecological Services
U.S. Fish and Wildlife Services
Region 3
Federal Building
1 Federal Drive
Ft. Snelling, MN 55111

U.S. Army Corps of Engineers
Louisville District
600 Dr. Martin Luther King, Jr. Place
Louisville, KY 40202-2232

Field Director
U.S. Department of the Interior
Fish and Wildlife Service
Ecological Services
6950 Americana Parkway, Suite H
Reynoldsburg, OH 43068-4127

State Agencies and Points of Contact

The Honorable Robert Taft
Governor of Ohio
Vern Riffe Center
77 South High Street, 30th Floor
Columbus, OH 43266-0601

Ms. Rachel M. Tooker
State Historic Preservation Officer
Ohio Historical Society
1982 Velma Avenue
Columbus, Oh 43211

Mr. Graham E. Mitchell
Chief
Ohio Environmental Protection Agency
Office of Federal Facility Oversight
401 East 5th Street
Dayton, OH 45402-2911

Ms. Debbie Woischke
Division of Natural Areas and Preserves
1889 Fountain Square, Bldg. F-1
Columbus, OH 43224-1388

Local Agencies and Points of Contact

The Honorable Rhine McLin
Mayor, Dayton, Ohio
City Hall, Second Floor
101 W. Third Street
Dayton, OH 45402

Ms. Marilyn Reid
Greene County Board of Commissioners
35 Greene Street
Xenia, OH 45385

Mr. W. Reed Madden
Greene County Board of Commissioners
35 Greene Street
Xenia, OH 45385

Mr. John Gower
Director, Planning and Community Development
City of Dayton
101 W. Third Street
Dayton, OH 45402

Mr. Ralph Harper
Greene County Board of Commissioners
35 Greene Street
Xenia, OH 45385

Mr. Kurt A. Rinehart
Assistant Chief Engineer
Miama Conservancy District
38 E. Monument Ave.
Dayton, OH 45402-1271

Mr. Richard Doran
Property Administrator
Miami Conservancy District
38 E. Monument Avenue
Dayton, OH 45402-1271

Mr. Joseph Klosterman
Montgomery County Planning Manager
451 West 3rd Street
10th Floor
P.O. Box 972
Dayton, OH 45422

Greene County
Regional Planning and Coordinating
651 Dayton-Xenia Road
Dayton, OH 45434

Greene County

Board of Commissioners

Ralph C. Harper
W. Reed Madden
Marilyn J. Reid

35 Greene Street
Xenia, Ohio 45385-3101

Phone: (937) 562-5006
Fax: (937) 562-5331
Administrator: (937) 562-5002
Adm. Mgr./Clerk: (937) 562-5165
Dayton Line: (937) 427-2883

February 3, 2004

Mr. Brian Hoppy
Program Manager
Engineering-Environmental Management, Inc.
3949 Pender Drive Suite 120
Fairfax, Va 22030

Dear Mr. Hoppy:

Please find the enclosed solicited input concerning the proposal and potential environmental consequences of the pending mission shift at Wright Patterson Air Force Base, from C-141C to C-5 Aircraft.

Our local zoning effort acknowledges and supports the aircraft modification. Greene County also sees little change in the environmental impact of this mission.

These opinions reflect that of the Greene County Board of Commissioners as well as the Greene County Regional Planning Commission. Thank you.

Sincerely,
THE GREENE COUNTY BOARD OF COMMISSIONERS

Ralph C. Harper, President

Marilyn J. Reid, Vice President

W. Reed Madden

Stephen Anderson, Interim Director
Regional Planning Commission

jma
attachment

C: Bee

Regional Planning and Coordinating Commission of Greene County

651 Dayton-Xenia Road, Xenia, Ohio 45385

(937) 562-7480 or (937) 427-2883 ext. 7480 Fax: (937) 562-7485

Memorandum

Date: January 29, 2004

To: Greene County Board of Commissioners C/O Howard Poston

From: Robert C. Schroeder, Director, RPCC

Subject: Response to engineering-environmental Management, Inc.

By correspondence that you provided the subject consultant **engineering-environmental Management, Inc.** has directly requested input from: Commissioners Harper, Madden, and Reid, as well as the Regional Planning and Coordinating Commission. We were requested individually by the Board of Commissioners to formulate a response. If appropriate, a joint letter may suffice.

Greene County has been aware of the impending mission shift at Wright Patterson Air Force Base from C-141C to C-5 Aircraft since 1997. It was at that time that the four county (Clark/Greene/Miami/Montgomery) Wright Patterson Air Force Base Zoning Commission re-drafted and adopted the applicable zoning regulations. As it relates to air traffic, that regulation to including the ACUZ noise and land use portion, assumed a major mission modification to the C-5 Aircraft in anticipation of the current proposal. Therefore, not only does this local zoning effort acknowledge and support the Aircraft modification, but also local land use planning efforts have been in consort with that anticipation. As a result of this long-term cooperative planning effort between local communities and Wright Patterson Air Force Base, Greene County sees little change in the environmental impact. As construction takes place, historically, the Air Force has implemented "best management practices" at WPAFB in deference to environmental issues to include floodplain, wetland, and natural area management. WPAFB has demonstrated that it is not only a major impact on the economy of Greene County and the Miami Valley Region, but also a good neighbor as it relates to operations and environmental impact on the effected communities.

Ohio EPA
State of Ohio Environmental Protection Agency
Southwest District

401 East Fifth Street
Dayton, Ohio 45402-2911

TELE: (937) 285-6357
FAX: (937) 285-6249

February 11, 2004

Brian Hoppy
Program Manager
e²M, Inc.
Suite 120
3949 Pencer Drive
Fairfax, Virginia 22030

RE: **Description of Proposed Action and Alternatives for the 445th Airlift Conversion from C-141C to C-5 Aircraft at Wright-Patterson Air Force Base, OH**

Dear Mr. Hoppy:

The Ohio Environmental Protection Agency (Ohio EPA) has reviewed the Description of Proposed Action and Alternatives for the 445th Airlift Conversion from C-141C to C-5 Aircraft at Wright-Patterson Air Force Base, OH dated January 2004 and received on January 23, 2004. Ohio EPA's comments are attached.

Should you have any questions, please contact me at (937) 285-6018.

Sincerely,

Graham E. Mitchell
Chief
Office of Federal Facilities Oversight

cc: Ron Lester, 88th ABW/EM
Bonnie Buthker, OFFO
Justin Burke, OFFO

GEM/ca

OHIO EPA COMMENTS ON DESCRIPTION OF PROPOSED ACTION AND ALTERNATIVES FOR THE 445TH AIRLIFT WING CONVERSION FROM C-141C TO C-5 AIRCRAFT AT WRIGHT-PATTERSON AIR FORCE BASE, OH

General Comments:

1. The locations of proposed construction projects include areas that current groundwater monitoring wells in Wright-Patterson's Long-Term Groundwater Monitoring Program reside. The 445th Airlift Wing should take necessary precautions to ensure that monitoring wells are not damaged during construction activities. If a well is damaged, it will be necessary to properly plug and abandon the well and install an equivalent replacement well.

2. It is not clear if any locations of groundwater monitoring wells will be impacted by proposed expansion of parking lots and buildings based on the provided figures. If it has not been done, the 445th Airlift Wing should coordinate construction plans with the 88th Air Base Wing/Office of Environmental Management to determine if current well locations are in areas where parking apron expansion and construction expansion have been proposed.

United States Department of Agriculture

NRCS
Natural Resources Conservation Service
200 North High Street, Room 522
Columbus, Ohio 43215-2478
(614) 255-2472 Fax (614) 255-2549

February 17, 2004

Mr. Brian Hoppy
c2M, Inc.
3949 Pender Drive, Suite 120
Fairfax, Virginia 22030

Re: Environmental Assessment – for the 445th Airlift Wing Conversion from C-141C to C-5 Aircraft at Wright-Patterson Air Force Base, Ohio.

Dear Mr. Hoppy:

The Natural Resources Conservation Service has reviewed the Environmental Assessment for the proposed 445th Airlift Wing Conversion from C-141C to C-5 Aircraft at Wright-Patterson Air Force Base, Ohio.

Within the proposed project areas there are no soil types considered prime farmland. Construction should be done in a manner that minimizes erosion onsite and offsite. The Brookville USDA Service Center, at (937) 854-7646, may be contacted for assistance in planning erosion and sedimentation control measures.

Thank you for including the Natural Resources Conservation Service in your review of this proposed project. If you have any questions, please contact Paul DeArman, State Resource Conservationist, at (614) 255-2461.

Sincerely,

Michelle Lohstroh

MICHELLE LOHSTROH
Acting State Conservationist

cc:
Diane E. Gelburd, Director, Ecological Sciences Division, Washington, D. C.
Paul DeArman, State Resource Conservationist, Columbus, Ohio
Steve Boeder, District Conservationist, Brookville, Ohio

-----Original Message-----
From: Sanders, Randy [mailto:Randy.Sanders@dnr.state.oh.us]
Sent: Thursday, February 19, 2004 4:25 PM
To: 'bhoppy@e2m.net'
Cc: Bankey, Mindy; Culver, Brent; Fletcher, Bob; Gibson, Russ; Grieszmer, Butch; Hull, Dennis; Jenkins, Becky; Karas, Don; Lee, Tara; Lindsley, Deborah; Mary Knapp; Mathews, John; Miller, Phil; Mion, Joe; Rogers, Matt; Woischke, Debbie
Subject: 04-0028; Air Force Reserve Command

Brian, please let me know that you received these comments. thanks, Randy
Sanders, ODNR Environmental Administrator

Ohio Department of Natural Resources Comments
445TH Airlift Wing Conversion From C-141C Aircraft to C-5 Aircraft at Wright-Patterson Air Force Base, Ohio.
Headquarters, Air Force Reserve Command, Environmental Division, 255 Richard Ray Boulevard, Robins Air Force Base, Georgia 31098-1637.

The Ohio Department of Natural Resources (ODNR) has completed a review of the above referenced project. These comments were generated by an inter-disciplinary review within the Department. These comments have been prepared under the authority of the Fish and Wildlife Coordination Act (48 Stat. 401, as amended; 16 U.S.C. 661 et seq.), the National Environmental Policy Act, the Coastal Zone Management Act, Ohio Revised Code and other applicable laws and regulations. These comments are also based on ODNR's experience as the state natural resource management agency and do not supersede or replace the regulatory authority of any local, state or federal agency nor relieve the applicant of the obligation to comply with any local, state or federal laws or regulations.

The site is located at Wright Patterson AFB, Bath Twp., Greene Co., Fairborn Quadrangle. The ODNR Natural Heritage Database contains records of rare species within the proposed project area. The attached map displays the locations of these records and corresponds with the attached list. Becky Jenkins of the Division of Wildlife should be consulted regarding rare animal species. She can be reached at (614) 265-6631.

There are no state nature preserves or scenic rivers in the vicinity of the site. However the site contains the Huffman Metro park. Five Rivers Metro Parks should be consulted regarding possible impacts to this area. They can be reached at (937) 275-7275. The site also contains the Dayton Aviation Heritage park. They can be reached at (937) 225-7705.

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ODNR recommends that adequate treatment of storm water is designed into the project for potential surface and groundwater impacts due to the possible release of pollutants. Besides potential groundwater resources, this area is near the Mud Run and the Mad River and should be designed not only to treat surface runoff, but also to contain potential spills and/or discharges of maintenance materials such as fuel or deicing substances.

The proposed projects may or may not be located in a Special Flood Hazard Area. To assist you in this determination, please contact the community's floodplain administrator. A list of community floodplain administrators can be found on the ODNR - Division of Water website at http://www.dnr.state.oh.us/water/floodpln/. To view a copy of a Flood Insurance Rate Map for your project area, you can either contact the community floodplain administrator, or obtain a copy online from the FEMA Flood Map Store at http://store.msc.fema.gov/.

ODNR appreciates the opportunity to provide these comments. Please contact Randy Sanders at 614.265.6344 if you have questions about these comments or need additional information.

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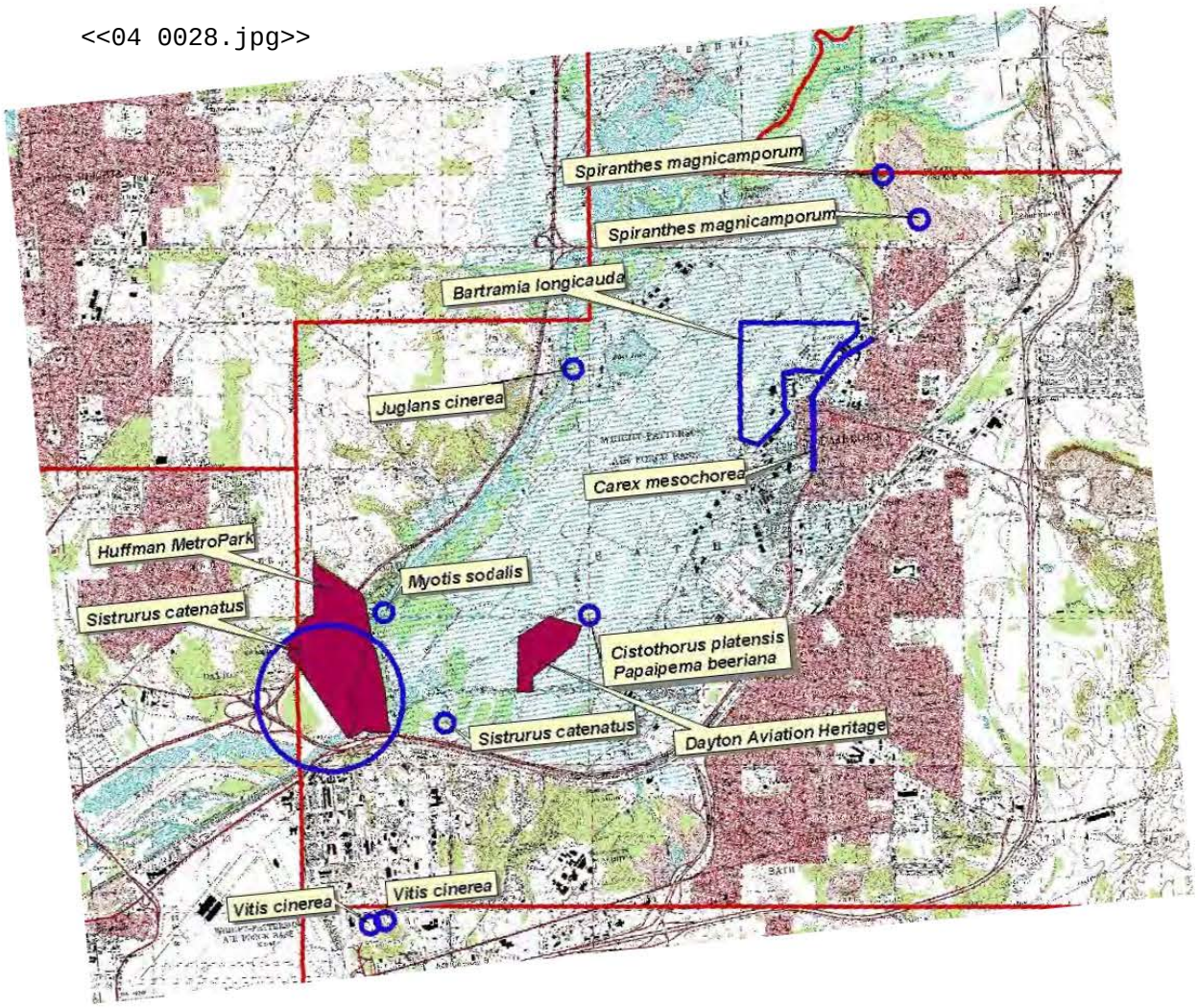
Spiranthes magnicamporum
Spiranthes magnicamporum
Bartramia longicauda
Juglans cinerea
Carex mesochorea
Huffman MetroPark
Myotis sodalis
Sistrurus catenatus
Cistothorus platensis
Papaipema beeriana
Sistrurus catenatus
Dayton Aviation Heritage
Vitis cinerea
Vitis cinerea

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#04-0028 Air Force Reserve Command

Scientific Name	Common Name	State Status	Federal Status
Bartramia longicauda	Upland Sandpiper	T	
Cistothorus platensis	Sedge Wren	SC	
Myotis sodalis	Indiana Bat	E	FE
Sistrurus catenatus	Eastern Massasauga	E	
Sistrurus catenatus	Eastern Massasauga	E	
Papaipema beeriana	Beer's Noctuid	E	
Carex mesochorea	Midland Sedge	T	
Juglans cinerea	Butternut	P	
Spiranthes magnicamporum	Great Plains Ladies'-tresses	P	
Spiranthes magnicamporum	Great Plains Ladies'-tresses	P	
Vitis cinerea	Pigeon Grape	P	
Vitis cinerea	Pigeon Grape	P	

E=Endangered
FE=Federally Endangered

FT=Federally Theatened
P=Potentially Threatened

SC=Special Concern
SI=Special Interest
T=Threatened

United States Department of the Interior

FISH AND WILDLIFE SERVICE

Ecological Services
6950 Americana Parkway, Suite H
Reynoldsburg, Ohio 43068-4127
(614) 469-6923/Fax: (614) 469-6919

February 24, 2004

Brian Hoppy
E^2M, Inc.
3949 Pender Drive, Suite 120
Fairfax, VA 22030

Dear Mr. Hoppy:

This is in response to your January 20, 2004 letter requesting information we may have regarding the occurrence or possible occurrence of Federally-listed threatened or endangered species within the vicinity of the proposed conversion from C-141C to C-5 Aircraft at Wright-Patterson Air Force Base, Greene County, Ohio. The proposed conversion would require ten construction projects to replace existing inadequate facilities. Existing facilities will either be demolished and rebuilt, or expanded. Per our conversation February 20, 2004, any project involving new construction will take place on 'improved lands', or land that is maintained, mowed, or paved. There are no Federal wildlife refuges, wilderness areas, or Critical Habitat within the vicinity of this project.

Per our conversation February 20, 2004, best management practices for erosion control will be in place. All disturbed areas should be mulched and revegetated with native plants. Prevention of non-native, invasive plant establishment is critical in maintaining quality habitats. Biologists from this office are available to assist with selection of native plant seed mixes. Issues relating to the potential increase in noise and air pollution due to the proposed conversion to the larger aircraft are being analyzed. The Service supports examining these potential impacts to the surrounding environment.

ENDANGERED SPECIES COMMENTS: The proposed project lies within the range of the **Indiana bat** (*Myotis sodalis*), a Federally-listed endangered species. Summer habitat requirements for the Indiana bat are not well defined but the following are thought to be of importance:

1. Dead or live trees and snags with peeling or exfoliating bark, split tree trunk and/or branches, or cavities, which may be used as maternity roost areas.

2. Live trees (such as shagbark hickory) which have exfoliating bark.

3. Stream corridors, riparian areas, and upland woodlots which provide forage sites.

Should the proposed site contain trees exhibiting any of the characteristics listed above, we recommend that they and surrounding trees be saved wherever possible. If they must be cut, they should not be cut between April 15 and September 15.

If desirable trees are present and if the above time restriction is unacceptable, mist net or other surveys should be conducted to determine if bats are present. The survey should be designed and conducted in coordination with the endangered species coordinator for this office. The survey should be conducted in

June or July since the bats would only be expected in the project area from approximately April 15 to September 15.

The proposed project lies within the range of the **clubshell mussel** *(Pleurobema clava)*, a Federally-listed endangered species, and the **eastern massasauga** *(Sistrurus catenatus)*, a Federal candidate species. Due to the project type and location, the project, as proposed, will have no effect on these species. Relative to these species, this precludes the need for further action on this project as required by the 1973 Endangered Species Act, as amended.

Should additional information on listed or proposed species or their critical habitat become available or if new information reveals effects of the action that were not previously considered, this determination may be reconsidered. If project plans change or if portions of the proposed project were not evaluated, it is our recommendation that you contact our office for further review.

This technical assistance letter is submitted in accordance with provisions of the Fish and Wildlife Coordination Act (48 Stat. 401, as amended; 16 U.S.C.661 et seq.), the Endangered Species Act of 1973, as amended, and is consistent with the intent of the National Environmental Policy Act of 1969, and the U.S. Fish and Wildlife Service's Mitigation Policy.

If you have questions, or if we may be of further assistance in this matter, please contact Karyn Tremper at extension 13 in this office.

Sincerely,

Angela L. Zimmerman

for Mary Knapp, Ph.D.
Supervisor

cc: ODNR, DOW, SCEA Unit, Columbus, OH

-----Original Message-----
From: Brad.N.Davidson@faa.gov [mailto:Brad.N.Davidson@faa.gov]
Sent: Monday, April 26, 2004 9:36 AM
To: bhoppy@e2m.net
Subject: Comments from FAA: Detroit Airports District Office for the EA (Conversion from C-141C to C-5 aircraft at Wright-Patterson)

Mr. Hoppy,

Pursuant to our phone conversations on February 26, 2004 and April 12, 2004 the Detroit Airports District Office (ADO) of the FAA has the following comments regarding the January 2004 Environmental Assessment for he 445th Airlift Wing Conversion from C-141C to C-5 Aircraft at Wright-Patterson AIr Force Base, OH.

The Detroit ADO has no objections based on the information presented in the January 2004 EA providing that the conversion does not result in impact/changes to the navigable airspace by General Aviation or Commercial users in the surrounding areas.

The FAA-Detroit ADO thanks you for the opportunity to review and comment on the EA.

Brad N. Davidson, P.E.
Environmental Protection Specialist
Detroit - ADO
734-229-2916

The Environmental Assessment (EA) and Draft Finding of No Significant Impact (FONSI)/Finding of No Practicable Alternative (FONPA) were made available for public review from June 22 to July 22, 2004. The below Notice of Availability was published in the *Dayton Daily News* on June 22, 2004.

PUBLIC NOTICE

Notice of Availability

Draft Finding of No Significant Impact/Finding of No Practicable Alternative for the Environmental Assessment of the 445th Airlift Wing Conversion from C-141C to C-5 Aircraft at Wright-Patterson Air Force Base, Ohio

WRIGHT-PATTERSON AFB – Beginning June 22, 2004 through July 22, 2004, Environmental Management officials will accept comments on the Environmental Assessment (EA) of the 445th Airlift Wing (445 AW) Conversion from C-141C to C-5 Aircraft at Wright-Patterson Air Force Base (AFB), Ohio has been prepared. The U.S. Air Force is proposing to issue a Finding of No Significant Impact/ Finding of No Practicable Alternative (FONSI/FONPA) based on this EA. The analysis considered potential effects of the Proposed Action and the No Action Alternative on twelve resource areas: airspace management, noise, land use, air quality, safety, geological resources, water resources, biological resources, cultural resources, socioeconomics and environmental justice, infrastructure, and hazardous materials and wastes. The results, as found in the EA, show that the Proposed Action would not have an adverse impact on the environment—indicating that a FONSI would be appropriate. In addition, as found in the EA, there are no practicable alternatives to the Proposed Action and minor impacts to floodplains cannot be avoided—indicating a FONPA would be appropriate. An Environmental Impact Statement should not be necessary to implement the Proposed Action.

Copies of the Draft FONSI/FONPA and EA showing the analysis are available for review at the Fairborn Library, 1 East Main Street, Fairborn, OH 45324.

Written comments and inquiries on the FONSI/FONPA and EA should be directed to Mr. Tom Perdue, EIAP Program Manager, 937-257-5532, 88 ABW/EMO, 5490 Pearson Road, WPAFB, OH 45433-5332, thomas.perdue@wpafb.af.mil or Susan Murphy, 88 ABW/PA, 1865 4th Street, Wright-Patterson AFB, OH 45433-7129, (937) 255-1840, susan.murphy@wpafb.af.mil.

In addition, the following privacy advisory was published as part of the Cover Sheet to the Draft EA.

Privacy Advisory

Your comments on this EA are requested. Letters or other written comments provided may be published in the EA. Comments will normally be addressed in the EA and made available to the public. Any personal information provided will be used only to identify your desire to make a statement during the public comment period or to fulfill requests for copies of the EA or associated documents. Private addresses will be compiled to develop a mailing list for those requesting copies of the EA. However, only the names of the individuals making comments and specific comments will be disclosed; personal home addresses and phone numbers will not be published in the EA.

Comment

Sent: Thursday, July 01, 2004 8:56 PM
To: susan.murphy@wpafb.af.mil
Subject: Conversion of C-141c to C-5 aircraft

This is followup to our conversation regarding the public notice in the Dayton Daily News, as you requested. I am a Family Physician in Beavercreek, who is against the conversion from C-141c aircraft to C-5 aircraft at the WPAFB. Both my home and my office are off of Kemp Road in the direct flight path of aircraft taking off from the Base. On the few occasions that C-5s have flown over, the windows and foundation rattled to the point where I looked out to see if a crash were imminent. Because of the environmental impact on surrounding neighborhoods at the sound of this aircraft, and speaking as a Trustee of the Spicer Heights Neighborhood, I am against this conversion.

Harold Brown, DO

Response

Comment noted. Noise and safety are principal concerns associated with aircraft operations. Under the proposed aircraft conversion, C-5 aircraft operations would decrease by 53.7 percent compared with current C-141 aircraft operations. As indicated in Section 4.2 of this Environmental Assessment, the noise contours would be less than the Maximum Mission Scenario, which included both C-141 and C-5 operations. The 445th Airlift Wing adheres to all designated approach and departure patterns and follows all safety requirements. Safety concerns are addressed in Section 4.5 of this Environmental Assessment.

Comment

Perdue Thomas J Civ 88 ABW/EM

From: Hart David L Civ AFRL/VASV
Sent: Thursday, July 22, 2004 7:11 AM
To: Perdue Thomas J Civ 88 ABW/EM

Thomas, Capt. Chris Kurinec gave me your name in regards to WPAFB currently conducting an environmental assessment on how we (WPAFB) impact the surrounding areas. He has been over to my house which is in the flight path for WPAFB, which can be very loud, and brought this assessment up. I don't know if you can help or if this is helpful. But if contacting you can get the planes to fly higher then that would be great.

Thank You
David Hart
Air Force Research Laboratory
Combined Environment Verification

Response

Comment noted. Noise and safety are principal concerns associated with aircraft operations. Under the proposed aircraft conversion, C-5 aircraft operations would decrease by 53.7 percent compared with current C-141 aircraft operations. As indicated in Section 4.2 of this Environmental Assessment, the noise contours would be less than the Maximum Mission Scenario, which included both C-141 and C-5 operations. The 445th Airlift Wing adheres to all designated approach and departure patterns and follows all safety requirements. Safety concerns are addressed in Section 4.5 of this Environmental Assessment.

APPENDIX B

NOISE TERMINOLOGY AND ANALYSIS METHODOLOGY

This Appendix presents a detailed discussion of noise and its effects on people and the environment. An assessment of aircraft noise requires a general understanding of how sound is measured and how it affects people in the natural environment. The purpose of this appendix is to address public concerns regarding aircraft noise impacts.

Section B.1 is a general discussion on the properties of noise. Section B.2 summarizes the noise metrics discussed throughout this Environmental Assessment (EA). Section B.3 provides Federal land use compatibility guidelines that are used in applying aircraft noise impacts to land use planning in the airport environment.

B.1 GENERAL

Noise, often defined as unwanted sound, is one of the most common environmental issues associated with aircraft operations. Of course, aircraft are not the only source of noise in an urban or suburban surrounding, where interstate and local roadway traffic, rail, industrial, and neighborhood sources also intrude on the everyday quality of life. Nevertheless, aircraft are readily identifiable to those affected by their noise, and typically are singled out for special attention and criticism. Consequently, aircraft noise problems often dominate analyses of environmental impacts.

Sound is a physical phenomenon, and consists of minute vibrations that travel through a medium, such as air, and are sensed by the human ear. Whether that sound is interpreted as pleasant or unpleasant depends largely on the listener's current activity, past experience, and attitude toward the source of that sound. It is often true that one person's music is another person's noise.

The measurement and human perception of sound involves two basic physical characteristics, intensity and frequency. The intensity is a measure of the strength or amplitude of the sound vibrations and is expressed in terms of sound pressure. The higher the sound pressure, the more energy carried by the sound and the louder is the perception of that sound. The second important physical characteristic is sound frequency which is the number of times per second the air vibrates or oscillates. Low-frequency sounds are characterized as rumbles or roars, while high-frequency sounds are typified by sirens or screeches.

The loudest sounds which can be detected comfortably by the human ear have intensities which are 1,000,000,000,000 times larger than those of sounds which can just be detected. Because of this vast range, any attempt to represent the intensity of sound using a linear scale becomes very unwieldy. As a result, a logarithmic unit known as the decibel (dB) is used to represent the intensity of a sound. Such a representation is called a sound level.

Because of the logarithmic nature of the decibel unit, sound levels cannot be added or subtracted directly and are somewhat cumbersome to handle mathematically. However, some simple rules of thumb are useful in dealing with sound levels. First, if a sound's intensity is doubled, the sound level increases by 3 dB, regardless of the initial sound level. For example:

$$60 \text{ dB} + 60 \text{ dB} = 63 \text{ dB}, \text{ and}$$

$$80 \text{ dB} + 80 \text{ dB} = 83 \text{ dB}$$

The total sound level produced by two sounds of different levels is usually only slightly more than the higher of the two. For example:

$$60.0 \text{ dB} + 70.0 \text{ dB} = 70.4 \text{ dB}$$

Because the addition of sound levels behaves differently than that of ordinary numbers, such addition is often referred to as "decibel addition" or "energy addition." The latter term arises from the fact that what we are really doing when we add decibel values is first converting each decibel value to its corresponding acoustic energy, then adding the energies using the normal rules of addition, and finally converting the total energy back to its decibel equivalent.

An important facet of decibel addition arises later when the concept of time-average sound levels is introduced to explain Day-Night Average Sound Level (DNL). Because of the logarithmic units, the time-average sound level is dominated by the louder levels that occur during the averaging period. As a simple example, consider a sound level which is 100 dB and lasts for 30 seconds, followed by a sound level of 50 dB which also lasts for 30 seconds. The time-average sound level over the total 60-second period is 97 dB, not 75 dB.

A sound level of 0 dB is approximately the threshold of human hearing and is barely audible under extremely quiet listening conditions. Normal speech has a sound level of approximately 60 dB. Sound levels above about 120 dB begin to be felt inside the human ear as discomfort and eventually pain at still higher levels.

The minimum change in the time-average sound level of individual events which an average human ear can detect is about 3 dB. A change in sound level of about 10 dB is usually perceived by the average person as a doubling (or halving) of the sound's loudness, and this relation holds true for loud sounds and for quieter sounds.

Sound frequency is pitch measured in terms of hertz (Hz). The normal human ear can detect sounds which range in frequency from about 20 Hz to about 15,000 Hz. All sounds in this wide range of frequencies, however, are not heard equally well by the human ear, which is most sensitive to frequencies in the 1,000 to 4,000 Hz range. To account for the varied frequency sensitivity of people, we use the A-weighted scale that approximates the average, healthy human ear. The A-weighting de-emphasizes the low and high frequency portion of the noise signal and emphasizes the mid-frequency portion. Sound levels measured using A-weighting are most properly called A-weighted sound levels while sound levels measured without any frequency weighting are most properly called sound levels. However, since most environmental impact analysis documents deal only with A-weighted sound levels, the adjective "A-weighted" is often omitted, and A-weighted sound levels are referred to simply as sound levels. In some instances, the author will indicate that the levels have been A-weighted by using the abbreviation dBA or dB(A), rather than the abbreviation dB, for decibel. As long as the use of A-weighting is understood to be used, there is no difference implied by the terms "sound level" and "A-weighted sound level" or by the units dB, dBA, and dB(A). The A-weighting function de-emphasizes higher and especially lower frequencies to which humans are less sensitive. Because the A-weighting is closely related to human hearing characteristics, it is appropriate to use A-weighted sound levels when assessing potential noise effects on humans and many terrestrial wildlife species. In this document, all sound levels are A-weighted and are reported in dB.

Sound levels do not represent instantaneous measurements but rather averages over short periods of time. Two measurement time periods are most common: 1 second and 1/8 of a second. A measured

sound level averaged over 1 second is called a slow response sound level; one averaged over 1/8 of a second is called a fast response sound level. Most environmental noise studies use slow response measurements, and the adjective "slow response" is usually omitted. It is easy to understand why the proper descriptor "slow response A-weighted sound level" is usually shortened to "sound level" in environmental impact analysis documents.

B.2 NOISE METRICS

A "metric" is defined as something "of, involving, or used in measurement." As used in environmental noise analyses, a metric refers to the unit or quantity that measures or represents the effect of noise on people. Noise measurements typically have involved a confusing proliferation of noise metrics as individual researchers have attempted to understand and represent the effects of noise. As a result, past literature describing environmental noise or environmental noise abatement has included many different metrics. Recently, however, various Federal agencies involved in environmental noise mitigation have agreed on common metrics for environmental impact analyses documents, and both the Department of Defense (DOD) and the Federal Aviation Administration (FAA) have specified those which should be used for Federal aviation noise assessments. These metrics are as follows.

B.2.1 Maximum Sound Level

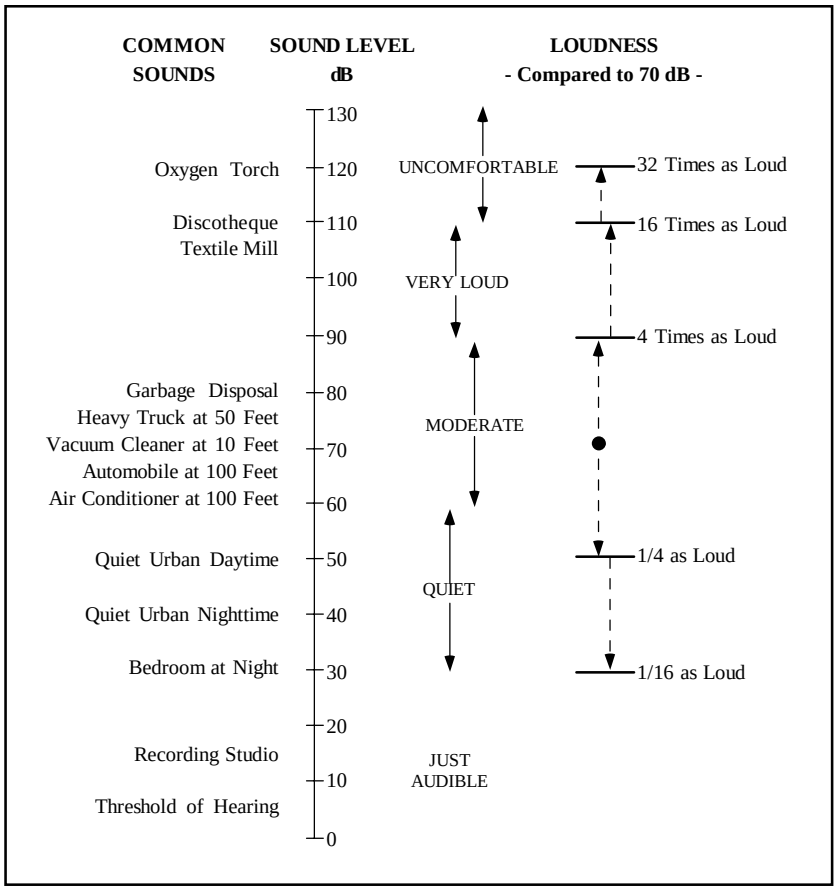
The highest A-weighted sound level measured during a single event in which the sound level changes value as time goes on (e.g., an aircraft overflight) is called the maximum A-weighted sound level or maximum sound level, for short. It is usually abbreviated by ALM, L_{max}, or L_{Amax}. The typical A-weighted levels of common sounds are shown in Figure B-1. The maximum sound level is important in judging the interference caused by a noise event with conversation, TV or radio listening, sleep, or other common activities.

B.2.2 Sound Exposure Level

Individual time-varying noise events have two main characteristics: (1) a sound level which changes throughout the event, and (2) a period of time during which the event is heard. Although the maximum sound level, described above, provides some measure of the intrusiveness of the event, it alone does not completely describe the total event. The period of time during which the sound is heard is also significant. The sound exposure level (abbreviated SEL or LAE) combines both of these characteristics into a single metric.

Sound exposure level is a logarithmic measure of the total acoustic energy transmitted to the listener during the event. Mathematically, it represents the sound level of the constant sound that would, in one second, generate the same acoustic energy as did the actual time-varying noise event. Since aircraft overflights usually last longer than one second, the SEL of an overflight is usually greater than the maximum sound level of the overflight.

Sound exposure level is a composite metric which represents both the intensity of a sound and its duration. It does not directly represent the sound level heard at any given time, but rather provides a measure of the net impact of the entire acoustic event. It has been well established in the scientific community that SEL measures this impact much more reliably than just the maximum sound level. Because the SEL and the maximum sound level are both A-weighted sound levels expressed in dBs, there is sometimes confusion between the two, so the specific metric used should be clearly stated.



Source: Harris 1979

Figure B-1. Typical A-Weighted Sound Levels of Common Sounds

B.2.3 Day-Night Average Sound Level

Time-average sound levels are the measurements of sound levels which are averaged over a specified length of time. These levels provide a measure of the average sound energy during the measurement period.

For the evaluation of community noise effects, and particularly aircraft noise effects, the day-night average sound level (abbreviated DNL or L_{dn}) is used. Day-night average sound level averages aircraft sound levels at a location over a complete 24-hour period, with a 10-dB adjustment added to those noise events which take place between 10:00 p.m. and 7:00 a.m. (local time) the following morning. This 10 dB "penalty" represents the added intrusiveness of sounds which occur during normal sleeping hours, both because of the increased sensitivity to noise during those hours and because ambient sound levels during nighttime are typically about 10 dB lower than during daytime hours.

Ignoring the 10 dB nighttime adjustment for the moment, DNL may be thought of as the continuous A-weighted sound level which would be present if all of the variations in sound level which occur over a 24-hour period were smoothed out so as to contain the same total sound energy.

DNL provides a single measure of overall noise impact, but does not provide specific information on the number of noise events or the individual sound levels which occur during the day. For example, a DNL of 65 dB could result from a very few noisy events, or a large number of quieter events.

As noted earlier for SEL, DNL does not represent the sound level heard at any particular time, but rather represents the total sound exposure. Scientific studies and social surveys which have been conducted to appraise community annoyance to all types of environmental noise have found the DNL to be the best measure of that annoyance. Its use is endorsed by the scientific community (American National Standards Institute [ANSI] 1980, 1988; U.S. Environmental Protection Agency [USEPA] 1974; Federal Interagency Committee on Urban Noise [FICUN] 1980; Federal Interagency Committee on Noise [FICON] 1992).

There is, in fact, a remarkable consistency in the results of attitudinal surveys about aircraft noise conducted in different countries to find the percentages of groups of people who express various degrees of annoyance when exposed to different levels of DNL. This is illustrated in Figure B-2, which summarizes the results of a large number of social surveys relating community responses to various types of noises, measured in DNL.

Figure B-2 is taken from Schultz (1978) and shows the original curve fit. A more recent study has reaffirmed this relationship (Fidell et al. 1991). Figure B-3 shows an updated form of the curve fit in comparison with the original (Finegold et al. 1992). The updated fit, which does not differ substantially from the original, is the current preferred form. In general, correlation coefficients of 0.85 to 0.95 are found between the percentages of groups of people highly annoyed and the level of average noise exposure. The correlation coefficients for the annoyance of individuals are relatively low, however, on the order of 0.5 or less. This is not surprising, considering the varying personal factors which influence the manner in which individuals react to noise. Nevertheless, findings substantiate that community annoyance to aircraft noise is represented quite reliably using DNL.

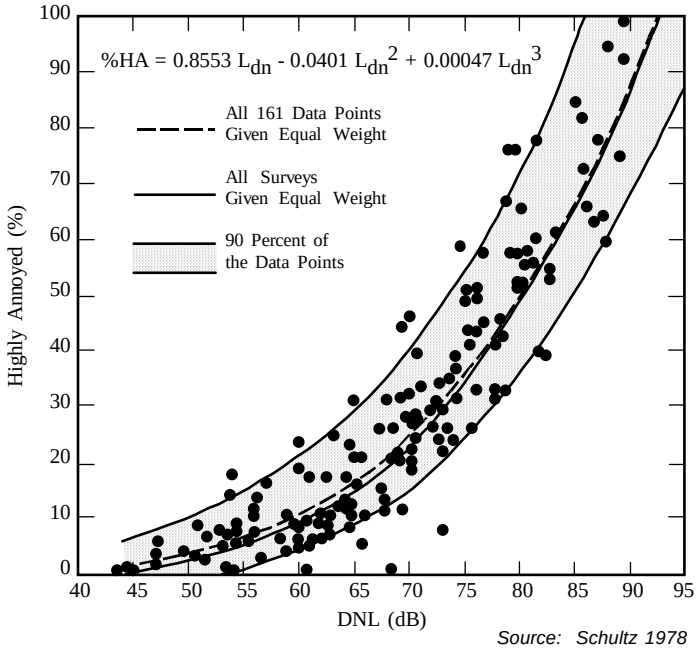
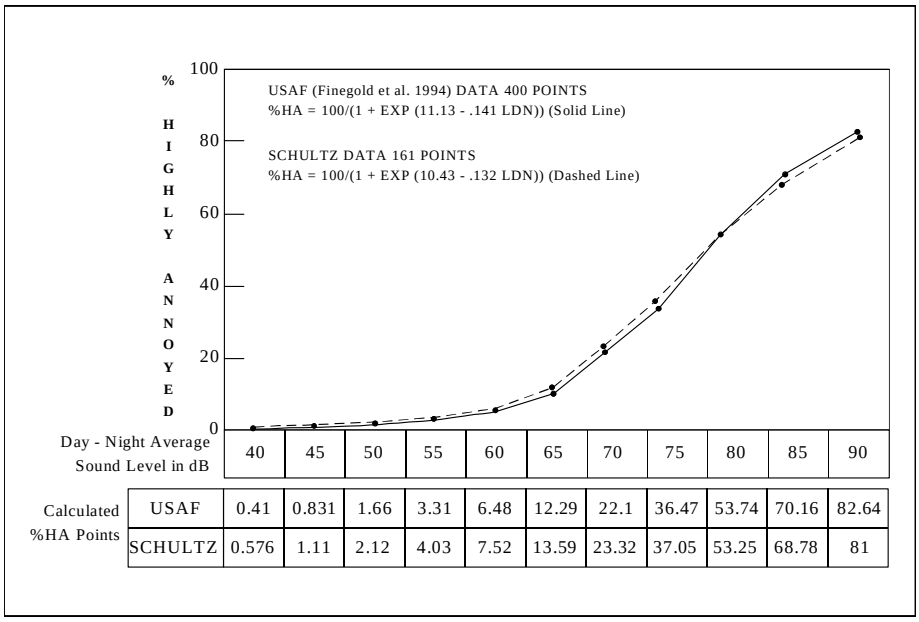


Figure B-2. Community Surveys of Noise Annoyance



Day - Night Average Sound Level in dB		40	45	50	55	60	65	70	75	80	85	90
Calculated %HA Points	USAF	0.41	0.831	1.66	3.31	6.48	12.29	22.1	36.47	53.74	70.16	82.64
	SCHULTZ	0.576	1.11	2.12	4.03	7.52	13.59	23.32	37.05	53.25	68.78	81

Sources: Schultz 1978 and Finegold et al. 1994

Figure B-3. Response of Communities to Noise and Comparison of Original Schultz 1978 and Current USAF Curve Fits

This relation between community annoyance and time-average sound level has been confirmed, even for infrequent aircraft noise events. A National Aeronautics and Space Administration (NASA) study reported the reactions of individuals in a community to daily helicopter overflights, ranging from 1 to 32 per day (Fields and Powell 1985). The stated reactions to infrequent helicopter overflights correlated quite well with the daily time-average sound levels over this range of numbers of daily noise events.

The use of DNL has been criticized recently as not accurately representing community annoyance and land-use compatibility with aircraft noise. Much of that criticism stems from a lack of understanding of the basis for the measurement or calculation of DNL. One frequent criticism is based on the inherent feeling that people react more to single noise events and not as much to "meaningless" time-average sound levels.

Time-average noise metric, such as DNL, takes into account both the noise levels of all individual events which occur during a 24-hour period and the number of times those events occur. As described briefly above, the logarithmic nature of the decibel unit causes the noise levels of the loudest events to control the 24-hour average.

As a simple example of this characteristic, consider a case in which only one aircraft overflight occurs in daytime during a 24-hour period, creating a sound level of 100 dB for 30 seconds. During the remaining 23 hours, 59 minutes, and 30 seconds of the day, the ambient sound level is 50 dB. The DNL for this 24-hour period is 65.5 dB. Assume, as a second example that 10 such 30-second overflights occur in daytime hours during the next 24-hour period, with the same ambient sound level of 50 dB during the remaining 23 hours and 55 minutes of the day. The DNL for this 24-hour period is 75.4 dB. Clearly, the averaging of noise over a 24-hour period does not ignore the louder single events and tends to emphasize both the sound levels and number of events. This is the basic concept of a time-average sound metric, and specifically the DNL.

B.3 LAND-USE COMPATIBILITY

As noted above, the inherent variability between individuals makes it impossible to predict accurately how any individual will react to a given noise event. Nevertheless, when a community is considered as a whole, its overall reaction to noise can be represented with a high degree of confidence. As described above, the best noise exposure metric for this correlation is the DNL. In June 1980, an ad hoc FICUN published guidelines for considering noise in land use planning (FICUN 1980). These guidelines related DNL to compatible land uses in urban areas. The committee was composed of representatives from the DOD, Department of Transportation, Department of Housing and Urban Development; USEPA; and the Veterans Administration. Since the issuance of these guidelines, Federal agencies have generally adopted these guidelines to make recommendations to the local communities on land use compatibilities.

The FAA included the committee's guidelines in the Federal Aviation Regulations (USDOT 1984). These guidelines are reprinted in Table B-1, along with the explanatory notes included in the regulation. Although these guidelines are not mandatory (see Notes in Table B-1), they provide the best means for evaluating noise impact in airport communities. In general, residential land uses normally are not compatible with outdoor DNL (L_{dn} values) above 65 dB, and the extent of land areas and populations exposed to DNL of 65 dB and higher provides the best means for assessing the noise impacts of alternative aircraft actions.

In 1990, the FICON was formed to review the manner in which aviation noise effects are assessed and presented. This group released its report in 1992 and reaffirmed the use of DNL as the best metric for this purpose (FICON 1992).

Analyses of aircraft noise impacts and compatible land uses around DOD facilities are normally made using NOISEMAP (Moulton 1992). This computer-based program calculates DNL at many points on the ground around an airfield and draws contours of equal levels for overlay onto land-use maps of the same scale. The program mathematically calculates the DNL of all aircraft operations for a 24-hour period, taking into consideration the number and types of aircraft, their flight paths and engine thrust settings, and the time of day (daytime or nighttime) that each operation occurs.

Day-night average sound levels may also be measured directly around an airfield, rather than calculated with NOISEMAP; however, the direct measurement of annualized DNL is difficult and costly since it requires year-round monitoring or careful seasonal sampling. NOISEMAP provides an accurate projection of aircraft noise around airfields.

NOISEMAP also has the flexibility of calculating sound levels at any specified ground location so that noise levels at representative points under flight paths can be ascertained. NOISEMAP is most accurate for comparing "before and after" noise impacts which would result from proposed airfield changes or alternative noise control actions, so long as the various impacts are calculated in a consistent manner.

Table B-1. Land Use Compatibility Guidelines with Yearly

LAND USE	YEARLY DAY-NIGHT AVERAGE SOUND LEVELS IN DECIBELS					
	BELOW 65	65-70	70-75	75-80	80-85	OVER 85
Residential						
Residential, other than mobile homes and transient lodgings	*Y*	*N(1)*	*N(1)*	*N*	*N*	*N*
Mobile home parks	*Y*	*N*	*N*	*N*	*N*	*N*
Transient lodgings	*Y*	*N(1)*	*N(1)*	*N(1)*	*N*	*N*
Public Use						
Schools	*Y*	*N(1)*	*N(1)*	*N*	*N*	*N*
Hospitals & nursing homes	*Y*	*25*	*30*	*N*	*N*	*N*
Churches, auditoria, & concert halls	*Y*	*25*	*30*	*N*	*N*	*N*
Government services	*Y*	*Y*	*25*	*30*	*N*	*N*
Transportation	*Y*	*Y*	*Y(2)*	*Y(3)*	*Y(4)*	*Y(4)*
Parking	*Y*	*Y*	*Y(2)*	*Y(3)*	*Y(4)*	*N*
Commercial Use						
Offices, business, & professional	*Y*	*Y*	*25*	*30*	*N*	*N*
Wholesale & retail-building materials, hardware, and farm equipment	*Y*	*Y*	*Y(2)*	*Y(3)*	*Y(4)*	*N*
Retail trade-general	*Y*	*Y*	*25*	*30*	*N*	*N*
Utilities	*Y*	*Y*	*Y(2)*	*Y(3)*	*Y(4)*	*N*
Communication	*Y*	*Y*	*25*	*30*	*N*	*N*
Manufacturing and Production						
Manufacturing, general	*Y*	*Y*	*Y(2)*	*Y(3)*	*Y(4)*	*N*
Photographic & optical	*Y*	*Y*	*25*	*30*	*N*	*N*
Agriculture (except livestock) & forestry	*Y*	*Y(6)*	*Y(7)*	*Y(8)*	*Y(8)*	*Y(8)*
Livestock farming & breeding	*Y*	*Y(6)*	*Y(7)*	*N*	*N*	*N*
Mining & fishing, resource production & extraction	*Y*	*Y*	*Y*	*Y*	*Y*	*Y*
Recreational						
Outdoor sports arenas & spectator sports	*Y*	*Y(5)*	*Y(5)*	*N*	*N*	*N*
Outdoor music shells, amphitheaters	*Y*	*N*	*N*	*N*	*N*	*N*
Nature exhibits & zoos	*Y*	*Y*	*N*	*N*	*N*	*N*
Amusements, parks, resorts, & camps	*Y*	*Y*	*Y*	*N*	*N*	*N*
Golf courses, riding stables, & water recreation	*Y*	*Y*	*25*	*30*	*N*	*N*

Key:
Y (Yes) = Land use and related structures compatible without restrictions.
N (No) = Land use and related structures are not compatible and should be prohibited.
NLR = Noise Level Reduction (outdoor to indoor) to be achieved through incorporation of noise attenuation into the design and construction of the structure.
25 or 30 = Land use and related structures generally compatible; measures to achieve NLR of 25, 30, or 35 dB must be incorporated into design and construction of structures.
Notes:
(1) Where the community determines that residential or school uses must be allowed, measures to achieve outdoor-to-indoor NLR of at least 25 and 30 dB should be incorporated into building codes and be considered in individual approvals. Normal residential construction can be expected to provide an NLR of 20 dB; thus, the reduction requirements often are stated as 5, 10, or 15 dB over standard construction and normally assume mechanical ventilation and closed windows year-round. However, the use of NLR criteria will not eliminate outdoor noise problems.
(2) Measures to achieve NLR of 25 dB must be incorporated into the design and construction of portions of these buildings where the public is received, office areas, noise-sensitive areas, or where the normal noise level is low.
(3) Measures to achieve NLR of 30 dB must be incorporated into the design and construction of portions of these buildings where the public is received, office areas, noise-sensitive areas, or where the normal noise level is low.
(4) Measures to achieve NLR of 35 dB must be incorporated into the design and construction of portions of these buildings where the public is received, office areas, noise-sensitive areas, or where the normal level is low.
(5) Land-use compatible, provided special sound reinforcement systems are installed.
(6) Residential buildings require an NLR of 25 dB.
(7) Residential buildings require an NLR of 30 dB.
(8) Residential buildings not permitted.

Source: FAA 1985 and USDOT 1984

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APPENDIX C

CLEAN AIR ACT

GENERAL CONFORMITY ANALYSIS

EXECUTIVE SUMMARY

Agencies: U.S. Air Force (USAF), Air Force Reserve Command (AFRC), 445th Airlift Wing (445 AW), Wright-Patterson Air Force Base (AFB), Ohio

Designation: Clean Air Act General Conformity Analysis

Affected Location: Wright-Patterson AFB, Ohio

Proposed Action: 445 AW conversion from C-141C aircraft to C-5 aircraft

Abstract:

AFRC is proposing an aircraft replacement for the 445 AW based at Wright-Patterson AFB, Ohio. The 445 AW currently possesses 16 C-141C Primary Assigned Aircraft (PAA). The 16 C-141C aircraft would be replaced by 10 C-5 PAA and 1 Backup Aircraft Inventory (BAI) for a total of 11 C-5 aircraft. Depending on aircraft availability and other external factors, either C-5A model or C-5B model aircraft would be beddown at Wright-Patterson AFB. The 16 C-141C aircraft will be retired over the next several years. The drawdown of C-141C aircraft is scheduled to begin in Fiscal Year 2005 (FY 05). The aircraft conversion, if implemented, would begin in FY 06 and end in FY 07. The Proposed Action would provide the necessary base infrastructure modifications and personnel changes to enable 445 AW aircrews to perform readiness training operations and ensure that resupply mission requirements for C-5 aircraft are met and sustained.

The Proposed Action at Wright-Patterson AFB would be located in the Dayton-Springfield Metropolitan Area, which is currently designated as a "maintenance" area for attainment with the National Ambient Air Quality Standard (NAAQS) for ozone (1-hour standard). In addition, the state of Ohio has recommended to U.S. Environmental Protection Agency (USEPA) that this metropolitan area be designated as nonattainment for *both* the 8-hour ozone standard and the very fine particulate matter ($PM_{2.5}$) standard of the future NAAQS.

On April 15, 2004, USEPA designated the Dayton-Springfield Metropolitan area as "basic" nonattainment with the 8-hour ozone standard (USEPA 2004a). This designation is effective on June 15, 2004. The USEPA has not yet drafted a new General Conformity Rule to Correspond to the new 8-hour ozone Standard, and no target date has been set for publication of a new draft rule (Stonefield 2004).

Redesignation of the Dayton-Springfield Metropolitan Area as nonattainment with the 8-hour ozone standard has no statutory impact on this Conformity Analysis. This is because Section 6 of 176.c of the Clean Air Act Amendments (CAAA) says that Conformity does not take effect until 1 year after the effective date of a nonattainment designation (Stonefield 2004). Furthermore, the General Conformity *de-minimis* thresholds under the current General Conformity Rule correspond to the CAAA Title V Major Stationary Source emissions thresholds for each nonattainment classification. The Major Stationary Source emission threshold for "basic" nonattainment with the 8-hour ozone standard is 100 tons per year of nitrogen oxides (NO_x) or volatile organic compounds (VOC) (USEPA 2004b). These are the same as the Major Stationary Source emission thresholds under "maintenance" with the current

1-hour ozone standard. Therefore, if we anticipate that the updated General Conformity Rule follows this precedent, the General Conformity *de-minimis* thresholds for NO_x and VOC in the Dayton-Springfield Metropolitan Area would not be expected to change over the next several years.

USEPA is expected to issue nonattainment designations for $PM_{2.5}$ on December 15, 2004. If designations are issued on that date, those designations will become effective on February 15, 2006. As is the case with the 8-hour ozone nonattainment designations, General Conformity requirements corresponding to the $PM_{2.5}$ nonattainment designations will not take effect until one year after the designations.

Based upon the conformity applicability criteria requirements, and the current attainment status of the areas affected by Wright-Patterson AFB operations, this conformity analysis focuses upon potential air emissions of ozone precursors, (i.e., VOC and NO_x). This analysis does not address the pollutants for which affected areas are in "attainment" – sulfur oxides (SO_x), nitrogen dioxide (NO_2), carbon monoxide (CO), fine particulate matter (PM_{10}), and Lead (Pb).

Emissions of VOC in the vicinity of Wright-Patterson AFB (Metropolitan Dayton Intrastate Air Quality Control Region [AQCR]) are expected to be reduced as a result of the Proposed Action. However, emissions of NO_2 are expected to increase as a result of the Proposed Action.

The conformity analysis completed for this project concluded that the Proposed Action at Wright-Patterson AFB would be exempt from the requirements of the Federal Conformity Rule. Emissions estimates attached to this analysis predict that the maximum year (2007) net emissions increase in NO_x would fall below the 100 tons per year *de minimis* threshold triggering a formal Conformity determination, as defined in 40 CFR 93.153(b)(2). In addition, the maximum net emissions increase would be well below the General Conformity Regional Significance threshold as defined in 40 CFR 93.152.

Conformity Analysis:

After careful and thorough consideration of the facts contained herein, and following consideration of the views of those agencies having jurisdiction by law or special expertise with respect to air quality impacts and the SIP, the project proponent finds that the proposed Federal actions are consistent with the objectives as set forth in Section 176(c) of the Clean Air Act (CAA), as amended, and its implementing regulation, 40 CFR Part 93, Subpart B, Determining Conformity of General Federal Actions to State and Local Implementation Plans, and said actions conform to the applicable SIP in accordance with the law.

The conformity analysis is based upon the total direct and indirect emissions associated with the proposed conversion of 16 C-141 to 11 C-5 aircraft at Wright-Patterson AFB. Future activity levels and aircraft operations associated with Wright-Patterson AFB addressed by this action may differ from those analyzed in this conformity analysis. If the Proposed Action is changed so that there would be a change in the total direct and indirect emissions reported in this analysis, a new conformity analysis will be performed.

TABLE OF CONTENTS

LIST OF TABLES

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C.1. Introduction

The Clean Air Act Amendments (CAAA) of 1990 require Federal agencies to ensure that their actions conform to the applicable State Implementation Plan (SIP). The SIP is a U.S. Environmental Protection Agency (USEPA)-approved plan developed by state or local agencies. It provides for implementation, maintenance, and enforcement of the National Ambient Air Quality Standards (NAAQS). The SIP includes emission limitations, rules, schedules, and specific control measures to attain and maintain the NAAQS. Conformity to a SIP, as defined in the Clean Air Act (CAA), means conforming to the SIP's purpose of reducing the severity and number of violations of the NAAQS to achieve attainment of such standards.

As a Federal agency and proponent of a "Federal Action," the U.S. Air Force (USAF) must complete a conformity analysis to determine whether the basing of C-5 aircraft and associated regulated pollutant emissions at Wright-Patterson AFB would conform to the Ohio SIP. This project includes the replacement of 16 C-141C Starlifter aircraft with 11 C-5 Galaxy aircraft as well as the demolition, modification, and construction of various facilities and buildings. Ten construction projects would be needed to provide adequate facilities for the C-5 airframe and required personnel training and support mission. Personnel authorizations would increase slightly, with the addition of 173 new technicians and drill enlisted staff. All elements of the Proposed Action could affect areas covered by the SIP, so a conformity analysis is required.

C.1.1 Background

The CAA and CAAA were passed by Congress and corresponding rules were promulgated by USEPA because it has been determined that certain pollutants have the potential to cause an adverse effect on public health and the environment when certain concentrations are exceeded in ambient air. In order to control and regulate these "criteria pollutants" and better maintain healthful air, NAAQS were established for six criteria pollutants. These pollutants include carbon monoxide (CO), nitrogen dioxide (NO_2), ozone (O_3), particulate matter less than 10 microns in diameter (PM_{10}), sulfur oxides (SO_x), and lead (Pb). Ozone is not typically emitted directly from emission sources, but rather is formed in the atmosphere by photochemical reactions involving sunlight and other emitted pollutants, or "ozone precursors." These ozone precursors consist primarily of nitrogen oxides (NO_x) and volatile organic compounds (VOCs), which are emitted directly from a wide range of stationary and mobile sources. Therefore, O_3 concentrations in the atmosphere are controlled through limiting the emissions of NO_2 and VOCs.

Air quality conformity provisions first appeared in the CAA of 1977. These provisions stated that no Federal agency could engage in; support in any way; provide financial assistance for; license, permit, or approve any activity that did not conform to a SIP after approval and promulgation. Section 176 (42 United States Code 7506c) of the CAA, as amended in 1990, further explained conformity to an implementation plan as meaning conformity to the plan's purpose of eliminating or reducing the severity of violations of the NAAQS, and achieving timely attainment of these standards. In November 1993, USEPA promulgated regulations and requirements that clarify the applicability, procedures, and analyses necessary to ensure that Federal facilities comply with the CAA.

In establishing the Final General Conformity Rule, USEPA requires Federal agencies to evaluate a proposed Federal action and ensure that it does not:

1. Cause a new violation of a NAAQS
2. Contribute to an increase in the frequency or severity of violations of NAAQS
3. Delay the timely attainment of any NAAQS, interim progress milestones, or other milestones toward achieving compliance with the NAAQS

The General Conformity Rule requires that Federal agencies consider total direct and indirect emissions of criteria pollutants. Conformity must be shown for those pollutants (or precursors) emitted in areas designated as nonattainment for those pollutants as well as pollutants for which an area has been redesignated from nonattainment to attainment (i.e., a maintenance area).

The Conformity Rule requires that Federal agencies do a conformity applicability analysis to determine whether a formal conformity determination is required. The two primary criteria used in an applicability analysis are the *de minimis* thresholds and the regional significance thresholds. The total direct and indirect emissions associated with a proposed action are compared to the *de minimis* threshold levels promulgated in 40 Code of Federal Regulations (CFR), 93.153(b). Table C-1 below presents the applicable *de minimis* thresholds under the General Conformity Rule.

If net changes in nonattainment pollutants do not exceed these *de minimis* threshold levels, the Conformity Rule also requires an analysis of "regional significance." This includes a comparison of the net emissions changes to the total emissions inventory of nonattainment pollutants for an affected nonattainment or maintenance area. If the net emissions changes associated with a proposed action are below *de minimis* thresholds *and* will not increase regional emissions by ten percent, the action is not considered regionally significant, and the action is exempt from further conformity rule requirements.

Table C-1. General Conformity Rule *de minimis* Emission Thresholds

Criteria Pollutant	Status	Degree or Classification	*de minimis* Limit Threshold (tpy)
Ozone (NO_x or VOCs)	Nonattainment	Extreme Severe Serious Moderate/marginal (inside ozone transport region) All others	10 25 50 50 (VOCs)/100 (NO_x) 100
	Maintenance	Inside ozone transport region Outside ozone transport region	50 (VOCs)/100 (NO_x) 100
CO	Nonattainment/ maintenance	All	100
PM_{10}	Nonattainment Maintenance	Serious Moderate N/A	70 100 100
SO_2	Nonattainment/ maintenance	All	100
NO_x	Nonattainment/ maintenance	All	100

Source: 40 CFR 93.153 (b)(2)
tpy: tons per year

When applicable, another required analysis is a comparison of the Federal action's emissions to any existing SIP emission budgets that have been established specifically for the Federal facility or the affected region. If the action would cause an increase in emissions such that the established SIP emissions budgets would be exceeded, a formal conformity determination and other applicable rule requirements would apply. In the case of Wright-Patterson AFB, there is no facility-specific emissions budget in the Ohio SIP (Kim 2004).

C.1.2 Purpose

The purpose of this general conformity analysis is to document the USAF's compliance with CAA requirements in accordance with 40 CFR 93(B) and Ohio Administrative Code, Chapter 3745-102.

This conformity analysis will analyze the air quality impact of emissions of nonattainment pollutants (i.e., NO_x and VOC) resulting from the proposed Federal action in order to determine whether the Proposed Action will be subject to these federal and state conformity rules.

C.1.3 Document Organization

The remainder of Section C.1 presents the purpose and background for the document, describes the proposed project at Wright-Patterson AFB and summarizes the existing air quality conditions in the region. Section C.2 of this analysis outlines the regulatory requirements of the General Conformity Rule and their relationships to this Conformity Determination.

Section C.3 details the applicability of the conformity rule to the proposed Wright-Patterson AFB C-5 conversion project. Section C.4 provides the conformity analyses results for the Proposed Action. Finally, the emissions estimations attached to this analysis detail the calculation methodologies and results used for this conformity analyses.

C.1.4 Existing Air Quality

Air Basins/Air Quality Control Regions

Wright-Patterson AFB is located in Greene and Montgomery counties, Ohio, which are in the Metropolitan Dayton Intrastate Air Quality Control Region (AQCR). The Metropolitan Dayton AQCR consists of the counties of Clark, Greene, Miami, Montgomery, Darke, and Preble.

Air quality resources in the Metropolitan Dayton AQCR are managed by the Ohio Environmental Protection Agency (OEPA), Division of Air Pollution Control (DAPC). Local permitting of stationary air emissions sources is delegated to the Regional Air Pollution Control Agency (RAPCA) in Dayton. Ambient air quality for the Metropolitan Dayton Intrastate AQCR, which was formerly classified as a maintenance area for the 1-hour O_3, is classified as a nonattainment area for the new 8-hour O_3 NAAQS (USEPA 1995). The Metropolitan Dayton Intrastate AQCR is designated as an unclassifiable/attainment area for all other criteria pollutants, which include SO_x, PM_{10}, CO, NO_2, and Pb.

Ambient Air Quality Attainment Designations for Affected Air Quality Control Region

On July 15, 2003, the state of Ohio recommended to USEPA Region 5 that the Dayton/Springfield Metropolitan Statistical Area (MSA) be designated as nonattainment with the future 8-hour ozone standard (Jones 2003). The Dayton/Springfield MSA is a portion of the Metropolitan Dayton AQCR, consisting of Clark, Greene, Miami, and Montgomery counties. In addition, the state of Ohio has

recommended to USEPA Region 5 that this metropolitan area be designated as nonattainment for future fine particulate matter ($PM_{2.5}$) standard (Jones 2004).

On April 15, 2004, USEPA designated the Dayton-Springfield Metropolitan area as "basic" nonattainment with the 8-hour ozone standard (USEPA 2004a). This designation became effective on June 15, 2004. The USEPA has not yet drafted a new General Conformity Rule to correspond to the new 8-hour ozone standard, and no target date has been set for publication of a new draft rule (Stonefield 2004).

Redesignation of the Dayton-Springfield Metropolitan Area as nonattainment with the 8-hour ozone standard has no statutory impact on this Conformity Analysis. This is because Section 6 of 176.c of the CAAA states that Conformity does not take effect until 1 year after the effective date of a nonattainment designation (Stonefield 2004). Furthermore, when the new General Conformity Rule is promulgated, the *de minimis* thresholds for the Dayton-Springfield Metropolitan Area are not expected to change. This is because the General Conformity *de minimis* thresholds under the current General Conformity Rule correspond to the CAAA Title V Major Stationary Source emissions thresholds for each nonattainment classification. The new Major Stationary Source emission threshold for "basic" nonattainment with the 8-hour ozone standard is 100 tons per year (tpy) NO_x or VOC (USEPA 2004b). These are the same as the old Major Stationary Source emission thresholds under ozone "maintenance" with the current 1-hour ozone standard. Therefore, if we anticipate that the updated General Conformity Rule follows this precedent, the General Conformity *de minimis* thresholds for NO_x and VOC in the Dayton-Springfield Metropolitan Area would be expected to remain at 100 tpy for the next several years.

USEPA is expected to issue nonattainment designations for $PM_{2.5}$ on December 15, 2004. If designations are issued on that date, those designations will become effective on February 15, 2006. As is the case with the 8-hour ozone nonattainment designations, General Conformity requirements corresponding to the $PM_{2.5}$ nonattainment designations will not take effect until one year after the designations.

Nonattainment Pollutants

Ozone is a secondary pollutant formed in the atmosphere by photochemical reactions of previously emitted pollutants (mainly VOCs and NO_x) and sunlight. A brown odorless gas, ozone can cause irritation of the respiratory tract in humans and animals, and can damage vegetation. The maximum

effect of the precursor emissions on O_3 formation may be many miles from the source because ozone is a by-product of a photochemical reaction.

State Implementation Plan

In accordance with Federal and state CAA requirements, the OEPA, and all agencies responsible for CAA implementation in nonattainment areas, must develop and implement a plan to reduce and maintain regulated air pollution levels that are less than the NAAQS. The most recent published USEPA action regarding the Ohio SIP was the "Approval and Promulgation of Maintenance Plans Revisions, Ohio" published in the August 25, 1997 Federal Register (USEPA 1997).

C.2. GENERAL CONFORMITY DETERMINATION REQUIREMENTS

C.2.1 Regulatory Background

USEPA has promulgated rules that establish the conformity determination criteria and procedures for Federal actions, pursuant to Section 176(c) of the CAA. The General Conformity Rule (40 CFR Part 93, Subpart B) defines the "general" conformity criteria and procedures for Federal agencies that propose to implement non-transportation projects. The Ohio Administrative Code Chapter 3745-102 contains the General Conformity Rules promulgated by the state of Ohio. These Ohio rules essentially mirror the requirements of the General Conformity Rule.

The General Conformity Rule applies to Federal actions in areas that are failing to meet one or more of the Federal air quality standards (designated as nonattainment areas), and/or areas that are subject to attainment maintenance plans (designated as maintenance areas). As noted in Section C.1, the Proposed Action would be located in the Metropolitan Dayton AQCR in Ohio. This AQCR has been designated a maintenance area for O_3. The AQCR is in attainment with NAAQS for each of the other criteria pollutants. This conformity applicability analysis will evaluate the conformity of the Proposed Action emissions of O_3 precursors (NO_2 and VOC) in the affected region.

The following subsections describe the General Conformity Rule procedures and criteria, and how they specifically pertain to this conformity analysis.

C.2.2 Exemptions and Applicability

Source Exemptions

The general conformity provisions identify specific Federal actions or portions of actions that are exempt from the conformity procedural requirement, because the USEPA has deemed these actions to conform. These actions include those that must undergo thorough air quality analysis to comply with other statutory requirements; actions that would result in no emission increase or an increase in emissions that is clearly *de minimis*; or actions presumed to conform by the agency through separate rule-making actions. These exemptions include the transfer of ownership of real property under 40 CFR 93.153(c)(2)(xiv and xx), as well as leasing agreements pending environmental restoration under 40 CFR 93.153(c)(2)(xix).

The only source exemption potentially applicable to the USAF's Proposed Action for basing of C-5 aircraft at Wright-Patterson AFB is the exemption for major new or modified *stationary* sources, which are subject to permits under OEPA's New Source Review (NSR) program or Prevention of

Significant Deterioration (PSD) program. New or modified stationary sources included in this Proposed Action include heating boilers, aircraft spot painting, fuel cell maintenance, refueling hydrants, and standby electrical generators.

de minimis and Regional Significance Thresholds

In addition to the specific source exemptions identified in the conformity rule, Federal actions might be exempt from the conformity requirements if the action meets the applicability criteria for *de minimis* emission levels *and* regional significance thresholds. The applicability determination procedures presented in the rule include the following elements:

- Define the applicable emission sources for the Federal action
- Quantify the total direct and indirect emissions of nonattainment pollutants from these sources
- Compare these emission rates against the appropriate *de minimis* emission levels or regionally significant thresholds

If the total direct and indirect emissions of nonattainment pollutants reach or exceed these applicability threshold values, a Conformity Determination must be prepared by the Federal agency before undertaking the action.

The conformity rule defines direct and indirect emissions based upon the timing and location of the emissions. "Direct" emissions are those that are caused or initiated by the Federal actions, and occur at the same time and place as the action. "Indirect" emissions are those that occur in the future or at a distance from the Federal action. In addition, the conformity rule limits the scope of indirect emissions to those that can be quantified and are *reasonably foreseeable* by the agency at the time of analysis, and those emissions that the Federal agency can practicably control and maintain control of through its continuing program responsibility.

The definitions of direct and indirect emissions do not distinguish among specific source categories; point, area, and mobile sources are given equal consideration in the conformity requirements. All substantive procedural requirements of the General Conformity Rule apply to the total of the net increases and decreases in direct and indirect emissions resulting from the action.

If the total of direct and indirect emissions from the action meet or exceed the *de minimis* or regional significant thresholds, the agency must perform a conformity determination to demonstrate the positive conformity of the Federal action. The *de minimis* emission levels vary by the criteria

pollutant and the severity of the region's nonattainment conditions. Regionally significant thresholds represent ten percent of the applicable SIP emissions inventory for nonattainment pollutants.

Section C.3 presents the specific emission thresholds and the applicability analysis results for the USAF's Proposed Action to retire 16 C-141C aircraft and beddown 11 C-5 aircraft at Wright-Patterson AFB.

C.2.3 CAA General Conformity Criteria

If the Proposed Action is not exempt from the conformity demonstration requirements, the General Conformity Rule defines conformity and provides five basic criteria to determine whether a Federal action conforms to an applicable SIP. These criteria assess conformity based upon emission analyses and/or dispersion modeling for the nonattainment pollutants. If the Federal action meets the conformity criteria and requirements, the action is demonstrated to conform to the applicable SIP. If the action cannot meet the criteria and requirements, the agency must develop an enforceable implementation plan to mitigate effectively (e.g., completely offset) the increased emissions from the Proposed Action to meet the conformity requirements. The Federal action cannot proceed unless positive conformity can be demonstrated.

The General Conformity Rule provides the option to select any one of several criteria to analyze the conformity of the Proposed Action. Presented in 40 CFR 93.158, the criteria are primarily based upon the type of pollutant and the status of the applicable SIP. If the applicability analysis concludes that further conformity analyses are required to demonstrate positive conformity (i.e., *de minimis* or regional significance thresholds are exceeded) the following conformity criteria (paraphrased below) can be used to demonstrate conformity for a proposed action in a nonattainment area:

- The total direct and indirect emissions for the Proposed Action are specifically identified and accounted for in the applicable SIP's attainment or maintenance demonstration. [40 CFR 93.158(a)(1)].
- The total direct and indirect emissions of O_3 precursors are fully offset within the same nonattainment or maintenance area through a revision to the applicable SIP or a similarly enforceable measure so that there is a no net increase in emissions [40 CFR 93.158(a)(2)].
- The State has made a revision to the area's attainment or maintenance demonstration after 1990 and the State either:
    - Determines and documents that the action, together with all other emissions in the nonattainment (or maintenance) area, *would not* exceed the emissions budget specified in the applicable SIP.

- Determines that the action, together with all other emissions in the nonattainment (or maintenance) area, *would* exceed the emissions budget specified in the applicable SIP but the State's Governor or designee for SIP actions makes a written commitment to the USEPA to demonstrate CAA conformity through specific measures and scheduled actions [40 CFR 93.158(a)(5)(i)(A & B)].

- The Federal action fully offsets its entire emissions within the same nonattainment area through a revision to the SIP a similar measure so that there is no net increase in nonattainment pollutant emissions [40 CFR 93.158(a)(5)(iii)].
- The State has not made a revision to the approved SIP since 1990, and the total emissions from the action do not increase emissions above the baseline emissions which are either:
  - Calendar Year 1990 (CY 90) emissions or another calendar year that was the basis for the nonattainment area designation) [40 CFR 93.158(a)(5)(iv)(A)].
  - Historic activity levels and emissions calculated for future years using appropriate emission factors and methods for future years.
- Dispersion modeling analysis demonstrates that direct and indirect emissions from the Federal action will not cause or contribute to violations of Federal ambient air quality standards.

C.2.4 Other State Implementation Plan Consistency Requirements

The conformity analysis must also demonstrate that total direct and indirect emissions from the Proposed Action will be consistent with the applicable SIP requirements and milestones, including:

- Reasonable further progress schedules
- Assumptions specified in the attainment or maintenance demonstration
- SIP prohibitions, numerical emissions limits, and work practice requirements

C.3. APPLICABILITY ANALYSIS

This section of the conformity analysis describes the applicability analysis of the proposed C-5 conversion project at Wright-Patterson AFB to the General Conformity Rule requirements.

C.3.1 Sources Included in the Conformity Analysis

In accordance with the General Conformity Rule, total direct and indirect emissions resulting from proposed Federal action includes numerous types of stationary and mobile sources. These emissions would occur during construction and operational conditions with the Proposed Action. As defined by the rule and applied to the Proposed Action at Wright-Patterson AFB, direct emissions would result from nonpermitted emissions sources as well as proposed C-5 flight operations. Examples of direct emissions sources include construction activities, aerospace ground equipment (AGE) devices, small space heating units, and fuel cell repair operations. Indirect pollutant emissions for the proposed project include activities that the USAF can control as part of the Federal action and include government-owned vehicles (GOVs) and privately-owned vehicles (POVs), and various military support activities at the base.

C.3.2 Total Direct and Indirect Emission Calculations

The estimates of the net changes in nonattainment pollutant emissions that would result from implementation of the Proposed Action at Wright-Patterson AFB are presented in the attachment of this Appendix. These calculations are based on a comparison of future activities to current operations at Wright-Patterson AFB, including operations and support of the existing 16 C-141C aircraft that are scheduled to be phased out and replaced by 11 C-5 aircraft. The resulting analyses indicate that the majority of the potential nonstationary pollutant impacts would result from three elements of the Proposed Action: (1) construction activities at Wright-Patterson AFB, (2) airfield operations at Wright-Patterson AFB, and (3) government and privately-owned motor vehicles. The net changes in direct and indirect VOC and NO_x emissions from these elements of the Proposed Action are presented below.

Construction Activities

AFRC has identified the need for ten construction projects to support the proposed beddown of C-5 aircraft at Wright-Patterson AFB. The construction projects would replace existing inadequate facilities and upgrade capabilities necessary to perform required activities. These projects include the demolition of two existing buildings, the construction of four new buildings, and several repaving and remodeling projects.

The construction activities would occur during a three-year period from fiscal year 2005 (FY 05) through FY 07. PM_{10} emissions would be generated in the form of fugitive dust from grading, site preparation, material storage, and equipment movement. All criteria pollutants would also be emitted during construction as combustion by-products from diesel and gasoline-fueled construction equipment and contractor commuting vehicles. VOC evaporative emissions would occur due to building painting and asphalt paving operations.

Table C-2 presents the estimated annual emissions of the nonattainment pollutants generated during construction activities at Wright-Patterson AFB. As shown, the greatest total annual pollutant emission rates for construction activities are projected to occur during CY 06.

Table C-2. Construction Activity Emissions from the Proposed Action at Wright-Patterson AFB

Construction Period (CY)	NO_x (tpy)	VOC (tpy)
2005	23.2	8.1
2006	36.1	11.8
2007	16.4	6.0

CY: Calendar Year
tpy: tons per year

Airfield Flight Operations

The replacement of the C-141C with C-5 aircraft would not be an instantaneous event, but rather would take place as a gradual transition. C-141 aircraft would be retired two or three at a time over a 15-month year period, starting in the spring of CY 05. The buildup of the C-5s would overlap with the draw down of the C-141 aircraft. The first C-5 would be expected during winter of CY 05, with additional aircraft arriving at a rate of approximately one or two airframes every three months until spring of CY 07.

C-5 operational activities would not reach full activity levels when construction activities are nearly completed. Though airfield operations and training flights would not cease during the transition, the expected pattern of draw down/buildup would result in a period of relatively low operations activity during the period of maximum construction activity. All six regulated criteria pollutants are emitted from these activities as by-products of fuel combustion.

Aircraft support operations, including AGE, fuel storage and handling, on- and off-road GOV use, touch-up surface coating, and fuel cell maintenance have been reviewed. Emissions from touch-up

surface coating, fuel storage and handling, and fuel cell maintenance might change slightly as a result of the Proposed Action, but the changes would not be significant, relative to normal year-to-year variations, and have, therefore, not been estimated. Furthermore, these sources are stationary sources that are subject to NSR permitting and, therefore, not subject to General Conformity analysis. Of all the emission-related activities at Wright-Patterson AFB, only airfield operations, which include landings and takeoffs (LTOs), touch-and-gos (TGOs), auxiliary power units, on-wing engine testing, and AGE would change significantly as a result of the Proposed Action. Table C-3 presents estimates of current C-141C airfield operations emissions as well as projections of the net changes in airfield operations emissions (relative to current activities) as a result of the Proposed Action.

Table C-3. Baseline and Net Changes in Military Airfield Operation Emissions Associated with the Proposed Action at Wright-Patterson AFB

Projected Year	NO_x (tpy)	VOC (tpy)
Current/Baseline C-141 Airfield Emissions:	53.4	97.9
2005 net change	-8.3	-25.3
2006 net change	+36.9	-72.2
2007 and beyond net change	+78.8	-88.9

tpy: tons per year

As shown in Table C-3, the expected emissions of VOC are less than current emissions for all future years under the Proposed Action. This is due to the fact that C-5 aircraft engines emit less VOC than C-141 aircraft engines, particularly under idling conditions. However, the expected emissions of NO_2 are expected to be significantly higher in future years under the Proposed Action. This is due to the fact that the C-5 aircraft engine produces more NO_2 than the C-141 aircraft engine under all thrust conditions. Detailed emission calculations for proposed airfield operations are presented in the attachment to this Conformity Analysis.

For the purposes of this analysis, an air pollutant 'mixing height' of 3,000 feet above ground level (AGL) has been assumed. That is, aircraft emissions released above this altitude are not considered to have any impact on ground-level air quality. Therefore, airfield activity emissions are tabulated from the ground up to 3,000 feet AGL.

Motor Vehicle Emissions

Motor vehicle emissions would include commute emissions associated with the additional permanent staff associated with the C-5 conversion, as well as with on-and off-road GOVs. Commuter and off-

road vehicle emissions associated with temporary construction workers and activities are included in the construction emissions in Table C-2 above.

The Proposed Action is expected to require the addition of 173 new technicians and drill enlisted staff. This represents an increase of approximately 10 percent in the number of Wright-Patterson AFB AFRC aircraft support staff. It has therefore been assumed that the vehicle usage for AFRC on- and off-road GOVs would increase by approximately 10 percent under the Proposed Action.

Table C-4 below lists the projected net increase in GOV and POV motor vehicle emissions under the Proposed Action. Table C-5 sums the net Proposed Action emissions changes from tables C-2 through C-4 above, and compare those impacts to the applicable General Conformity *de minimis* and regional significance thresholds.

Table C-4. Net Changes in Motor Vehicle Emissions Associated with the Proposed Action at Wright-Patterson AFB

Projected Year	NO_x (tpy)	VOC (tpy)
2005 net change	-	-
2006 net change	+1.4	+1.1
2007 and beyond net change	+1.4	+1.1

tpy: tons per year

Table C-5. Nitrogen Oxides (NO_x) and Volatile Organic Compounds (VOC) Emissions – Regional Significance Analysis and Comparison to Conformity *de minimis* Thresholds for Metropolitan Dayton Intrastate Air Quality Control Region

Criteria Pollutant	Ozone Attainment Status [1]	1999 Regional Inventory (tpy)	*de minimis* Threshold (tpy)	Proposed Action Emissions Net Change [2] (tpy)	% of AQCR Total Emissions Inventory
NO_x	Maintenance	48,907	100	91.2	0.2%
VOC	Maintenance	55,758	100	-82.3	-0.1%

[1] There are no NO_x (NO_2) nonattainment areas. The *de minimis* threshold for NO_x emissions is defined by the ozone attainment status.

[2] Net emissions change corresponding to 2007. Note that this table format does not evaluate the interim-year emissions increases shown in Tables C-2 through C-4. However, a review of Tables C-2 through C-4 shows that the net emissions change for interim years is less than the net change for 2007 and beyond for NO_x and negative (emissions will be reduced relative to current emissions) for all years for VOC.

tpy: tons per year

C.3.3 Applicability Analysis Results

Wright-Patterson AFB Operations

The results of the applicability analysis indicate that total cumulative peak year direct and indirect emissions at Wright-Patterson AFB (i.e., the sum of construction and airfield operations) within the Metropolitan Dayton Intrastate AQCR would *not* exceed the 100 tpy *de minimis* threshold level for NO_2. Therefore, state and Federal General Conformity rules are not applicable, and no conformity determination is required for this Proposed Action.

C.4. CONFORMITY ANALYSIS AND RESULTS

This section presents the conclusion of the conformity analysis for the proposed conversion of C-141 to C-5 aircraft at Wright-Patterson AFB. The purpose of this analysis is to determine whether the USAF's Proposed Action at Wright-Patterson AFB would conform to the applicable SIP, based upon the criteria established in the General Conformity Rule and promulgated in 40 CFR 93.158.

The regulatory basis and specific criteria for this analysis was presented in Section 2.0 above. This section presents the methods and results of the conformity analysis for the following criteria:

> *Determination of whether the direct and indirect emissions associated with the proposed federal action will exceed the conformity de-minimis thresholds in any affected Air Quality Control Region, and therefore in any affected nonattainment or maintenance area.[40 CFR, 93.153(b)(2)] and*
>
> *Determination of whether the direct and indirect emissions associated with the proposed federal action will represent 10 percent or more of a nonattainment or maintenance area's total emissions of that pollutant.[40 CFR, 93.153(c)(i)]*

These criteria are shown to be satisfied by the information presented in Section C.3, Tables C-2 through C-5. That is, the reasonably foreseeable project emissions of NO_2 and VOC would not exceed the General Conformity Rule *de minimis* levels. Furthermore, the reasonably foreseeable emissions of VOC and NO_2 would not represent an increase of ten percent or more of the regional emissions inventory for the region affected by the Proposed Action. These conclusions are supported by the calculations attached to this analysis.

Based upon the conformity analyses results summarized in the previous sections, the proposed Federal action at Wright-Patterson AFB has been shown to meet the conformity criteria for consistency with the Ohio SIP requirements. The proposed Federal actions are therefore consistent with the objectives as set forth in Section 176(c) of the CAA, as amended, and its implementing regulation, 40 CFR Part 93, Subpart B, Determining Conformity of General Federal Actions to State and Local Implementation Plans, and said actions conform to the applicable SIP in accordance with the law.

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Appendix C, Attachment 1 - Clean Air Act General Conformity Analysis Emission Calculations

Emissions Estimates for EA of 445th Airlift Wing Conversion from C-141C to C-5 Aircraft at Wright-Patterson AFB, OH

This workbook contains

Summary	(this worksheet) Summarizes total emissions by calendar year.
Construction Combustion	(one sheet for each calendar year) Estimates emissions from Construction non-road equipment exhaust as well as Construction Painting.
Construction Grading	(one sheet for each calendar year) Estimates the number of days of site preparation, to be used for estimating heavy equipment exhaust and earthmoving dust emissions in the fugitive dust worksheet. This sheet does not estimate emissions, but rather supports the Fugitive Dust calculation sheet.
Construction Fugitive Dust	(one sheet for each calendar year) Estimates fine particulate emissions from earthmoving, vehicle traffic, and windblown dust.
Airfield Operations	Estimates the net emissions change for airfield operations including landing/take-offs (LTOs), touch-and-gos (TGOs), on-wing engine testing, and auxiliary power units (APUs) for each calendar year.
AGE	Estimates the net emissions change for Aerospace Ground Equipment (AGE) with the implementation of the Proposed Action. AGE emissions are expected to be lower under the Proposed Action.
Metro. Dayton AQCR Tier Report	Air Emission Inventory (area and point sources) in tons per year (1999) for the Metropolitan Dayton Intrastate AQCR, used to compare Proposed Action emissions to regional significance thresholds.
POVs (separate worksheet)	Estimates commute emissions for publicly-owned vehicles to account for the commute emissions from the 173 additional staff associated with the Proposed Action. This worksheet also estimates commuting emissions for construction workers expected during the construction phase of the Proposed Action.
GOVs (separate worksheets)	Estimates the annual emissions for on-road and off-road government-owned vehicles. These vehicles are primarily used by aircraft maintenance staff. Because the aircraft maintenance staff is projected to grow by about 10%, the expected net increase of 10% in GOV emissions is included in this worksheet.

Summary of Proposed Action Emissions

Current

	NOx (tons)	HC (tons)	CO (tons)	SO_2 (tons)	PM_{10} (tons)
Construction Combustion	--	--	--	--	--
Construction Fugitive Dust	--	--	--	--	--
Construction Commuters	--	--	--	--	--
AGE	14.35	1.17	3.09	0.16	1.01
POVs (net increase)	--	--	--	--	--
GOVs (Off- and On-Road)	4.23	0.76	4.97	0.33	0.65
Aircraft Operations	53.37	97.90	148.52	12.65	36.64
TOTAL CURRENT	**71.95**	**99.83**	**156.58**	**13.14**	**38.31**

CY2005

	NOx (tpy)	VOC (tpy)	CO (tpy)	SO_2 (tpy)	PM_{10} (tpy)
Construction Combustion	22.62	7.44	19.79	1.12	1.85
Construction Fugitive Dust	--	--	--	--	12.22
Construction Commuters	0.61	0.64	8.98	0.05	0.54
AGE	9.86	0.81	2.12	0.11	0.69
POVs (net increase)	--	--	--	--	--
GOVs (Off- and On-Road)	4.23	0.76	4.97	0.33	0.65
Aircraft Operations	45.12	72.59	110.78	9.63	26.99
TOTAL CY2005	82.45	82.23	146.65	11.24	42.94

CY2006

	NOx (tpy)	VOC (tpy)	CO (tpy)	SO_2 (tpy)	PM_{10} (tpy)
Construction Combustion	34.75	10.46	30.87	1.71	2.77
Construction Fugitive Dust	--	--	--	--	14.45
Construction Commuters	1.30	1.35	19.08	0.10	1.15
AGE	8.07	0.66	1.74	0.09	0.57
POVs (net increase)	0.95	0.98	13.87	0.07	0.84
GOVs (Off- and On-Road)	4.65	0.84	5.47	0.36	0.72
Aircraft Operations	90.24	25.71	50.06	7.98	11.46
TOTAL CY2006	139.96	40.00	121.08	10.31	31.95

36.05 11.81

CY2007

	NOx (tpy)	VOC (tpy)	CO (tpy)	SO_2 (tpy)	PM_{10} (tpy)
Construction Combustion	16.14	5.65	14.83	0.78	1.22
Construction Fugitive Dust	--	--	--	--	2.27
Construction Commuters	0.31	0.32	4.49	0.02	0.27
AGE	8.97	0.73	1.93	0.10	0.63
POVs (net increase)	0.95	0.98	13.87	0.07	0.84
GOVs (Off- and On-Road)	4.65	0.84	5.47	0.36	0.72
Aircraft Operations	132.19	8.97	33.23	8.99	6.48
TOTAL CY2007	**163.21**	**17.49**	**73.82**	**10.32**	**12.42**

Net Emissions Changes for Proposed Action

Deltas for Proposed Action, Relative to Current Operations		NOx (tons)	HC (tons)	CO (tons)	SO_2 (tons)	PM_{10} (tons)
	CY2005	10.49	-17.60	-9.94	-1.90	4.64
	CY2006	68.01	-59.83	-35.50	-2.83	-6.35
	CY2007	91.26	-82.34	-82.76	-2.82	-25.88
CY2008 and Beyond		75.12	-87.99	-97.59	-3.60	-27.10

For 2008 and beyond, projected emissions will match 2007 emissions minus construction. Therefore, CY2007 is the maximum emissions year.

General Conformity Regional Significance Thresholds (10% of regional budget)

Since future year budgets for point and area sources combined were not readily available, actual 1999 air emissions inventories for the counties were used as an approximation of the regional inventory. Because the Proposed Action is several orders of magnitude below significance, the conclusion would be the same, regardless of whether future year budget data set were used.

Metropolitan Dayton Intrastate AQCR

	Point and Area Sources Combined				
Year	NOx (tpy)	VOC (tpy)	CO (tpy)	SO_2 (tpy)	PM_{10} (tpy)
1999	48,907	55,758	364,075	12,346	51,792

Source: USEPA-AirData NET Tier Report (http://www.epa.gov/air/data/nettier.html). Site visited on 2/6/04

Determination Significance (Significance Threshold = 10%)

	Point and Area Sources Combined				
	NOx (tpy)	VOC (tpy)	CO (tpy)	SO_2 (tpy)	PM_{10} (tpy)
Minimum -1999	48,907	55,758	364,075	12,346	51,792
2005 Proposed Action Net Emissions Change	10.49	-17.60	-9.94	-1.90	4.64
Proposed Action %	**0.0215%**	**-0.0316%**	**-0.0027%**	**-0.0154%**	**0.0090%**

Determination Significance (Significance Threshold = 10%)

	Point and Area Sources Combined				
	NOx (tpy)	VOC (tpy)	CO (tpy)	SO_2 (tpy)	PM_{10} (tpy)
Minimum -1999	48,907	55,758	364,075	12,346	51,792
2006 Proposed Action Net Emissions Change	68.01	-59.83	-35.50	-2.83	-6.35
Proposed Action %	**0.1391%**	**-0.1073%**	**-0.0098%**	**-0.0229%**	**-0.0123%**

Determination Significance (Significance Threshold = 10%)

	Point and Area Sources Combined				
	NOx (tpy)	VOC (tpy)	CO (tpy)	SO_2 (tpy)	PM_{10} (tpy)
Minimum -1999	48,907	55,758	364,075	12,346	51,792
2007 Proposed Action Net Emissions Change	91.26	-82.34	-82.76	-2.82	-25.88
Proposed Action %	**0.1866%**	**-0.1477%**	**-0.0227%**	**-0.0228%**	**-0.0500%**

For 2008 and beyond, projected emissions will match 2007 emissions minus construction. Therefore, CY2007 is the maximum emissions year.

445th Airlift Wing Conversion from C-141C to C-5 Aircraft at Wright-Patterson AFB, OH

Construction Combustion Emissions

Activity from Table 2-2 of the January 2004 DOPAA:

1	100% of Alter C-5 Airfield Pavement (Phase I)	334,998	ft2
2	100% of Construct C-5 Multipurpose Hangar	70,342	ft2
3	100% Demolish Building 4022	33,056	ft2

Construction Site Air Emissions
Combustion Emissions of ROG, NOx, SO2, CO and PM10 Due to Construction

User Inputs:

Total Building Area:	103,398	ft^2	(2 and 3)
Total Paved Area:	334,998	ft^2	(1)
Total Disturbed Area:	10.06	acres	(1, 2, and 3)
Construction Duration:	1.0	years	(assumed)
Annual Construction Activity:	230	days/yr	(assumed)

Results:[Average per Year Over the Construction Period]

	ROG	NOx	SO2	CO	PM10
Emissions, lbs/day	64.65	196.74	9.75	172.09	16.05
Emissions, tons/yr	7.44	22.62	1.12	19.79	1.85

Calculation of Unmitigated Emissions

Summary of Input Parameters

	(values duplicated across columns to simplify formulas below)				
Total new acres disturbed:	10.06	10.06	10.06	10.06	10.06
Total new acres paved:	7.69	7.69	7.69	7.69	7.69
Total new building space, ft^2:	103,398	103,398	103,398	103,398	103,398
Total years:	1.00	1.00	1.00	1.00	1.00
Area graded, acres in 1 yr:	10.06	10.06	10.06	10.06	10.06
Area paved, acres in 1 yr:	7.69	7.69	7.69	7.69	7.69
Building space, ft^2 in 1 yr:	103,398	103,398	103,398	103,398	103,398

Annual Emissions by Source (lbs/day)

	ROG	NOx	SO2	CO	PM10
Grading Equipment	2.5	16.1	1.1	3.5	2.8
Asphalt Paving	2.0	0.0	0.0	0.0	0.0
Stationary Equipment	17.4	14.2	0.9	3.1	0.8
Mobile Equipment	16.5	166.5	7.7	165.5	12.4
Architectural Coatings (Non-Res)	26.2	0.0	0.0	0.0	0.0
Total Emissions (lbs/day):	**64.7**	**196.7**	**9.7**	**172.1**	**16.1**

Emission Factors

Reference: Air Quality Thresholds of Significance, SMAQMD, 1994.

	SMAQMD Emission Factor				
Source	ROG	NOx	SO2 *	CO *	PM10
Grading Equipment	2.50E-01 lbs/acre/day	1.60E+00 lbs/acre/day	0.11 lbs/acre/day	0.35 lbs/acre/day	2.80E-01 lbs/acre/day
Asphalt Paving	2.62E-01 lbs/acre/day	NA	NA	NA	NA
Stationary Equipment	1.68E-04 lbs/day/ft^2	1.37E-04 lbs/day/ft^2	9.11E-06 lbs/day/ft^2	2.97E-05 lbs/day/ft^2	8.00E-06 lbs/day/ft^2
Mobile Equipment	1.60E-04 lbs/day/ft^2	1.61E-03 lbs/day/ft^2	7.48E-05 lbs/day/ft^2	0.0016 lbs/day/ft^2	1.20E-04 lbs/day/ft^2
Architectural Coatings (Non-Res)	8.15E-02 lbs/day/ft	NA	NA	NA	NA

* Factors for grading equipment and stationary equipment are calculated from AP-42 for diesel engines using ratios with the NOx factors. Factors for mobile equipment are calculated from ratios with Mobile5a 2001 NOx emission factors for heavy duty trucks for each site.

The guidance used for this analysis does not address combustion emissions associated with demolition. Demolition square footage is therefore counted the same as construction square footage. Debris transport emissions are expected to be comperable to material transport emissions for construction. Demolition may result in slightly more dust, but these emissions are very temporary.

Reasonableness check. This emissions estimation model does not attempt to evaluate each of the many processes that may be involved in a construction project. Rather, it takes several processes from a 'typical day' of a construction project, scales their magnitude to the size of the construction project, and assumes uniform activity every working day of the project in a manner intended to create a conservative over-estimate of emissions. Where a particular project involves unusual activity (e.g. removal of a large quantity of soil). A check should be made to ensure

that this default methodology is not under-estimating emissions.

Reasonableness check: 44,000 square yards of apron and hangar floor thick enough to support C-5s will require around 4,000 truck trips to bring in concrete, rebar, etc. and probably another 2,000 truck trips to haul away debris and excess dirt.
If we assumed 40 mile round trips, this is: 240,000 miles of heavy-duty truck traffic.
From the GOV worksheet, HDDV emission factors are:

HDDV Emission Factors (grams per mile)						
PM	**PM10**	**PM2.5**	**CO**	**NOx**	**SOx**	**VOCs**
40.3	7.73	2.01	12.0	8.2	0.51	2.0

Truck emissions are therefore (tons) 10.66 2.04 0.53 3.17 2.17 0.14 0.53
These values (other than the PM10) are a small fraction of the mobile equipment emissions that we are assuming in the estimates above.

445th Airlift Wing Conversion from C-141C to C-5 Aircraft at Wright-Patterson AFB, OH

Construction Fugitive Dust Emissions

Calculation of PM10 Emissions Due to Site Preparation (Uncontrolled).

User Input Parameters / Assumptions

Acres graded per year:	10.06	acres/yr	(From "Combustion" worksheet)
Grading days/yr:	33.01	days/yr	(From "Grading" worksheet)
Exposed days/yr:	90	assumed days/yr graded area is exposed	
Grading Hours/day:	8	hr/day	
Soil piles area fraction:	0.10	(assumed fraction of site area covered by soil piles)	
Soil percent silt, s:	8.5	%	(mean silt content; expected range: 0.5 to 23, AP-42 Table 13.2.2-1)
Soil percent moisture, M:	85	%	(NOAA 2003 http://www.cpc.noaa.gov/products/soilmst/drought_composite.html#CSMRP)
Annual rainfall days, p:	120	days/yr	rainfall exceeds 0.01 inch/day (AP-42 Fig 13.2.2-1)
Wind speed > 12 mph %, I:	12	%	Ave. of wind speed at Dayton, OH (ftp://ftp.wcc.nrcs.usda.gov/downloads/climate/windrose/ohio/dayton/)
Fraction of TSP, J:	0.5	(SCAQMD recommendation)	
Mean vehicle speed, S:	5	mi/hr	(On-site)
Dozer path width:	8	ft	
Qty construction vehicles:	1.43	vehicles	(From "Grading" worksheet)
On-site VMT/vehicle/day:	5	mi/veh/day	(Excluding bulldozer VMT during grading)
PM10 Adjustment Factor k	2.6	lb/VMT	(AP-42 Table 13.2.2-2 9/98 for PM10)
PM10 Adjustment Factor a	0.8	(dimensionless)	(AP-42 Table 13.2.2-2 9/98 for PM10)
PM10 Adjustment Factor b	0.4	(dimensionless)	(AP-42 Table 13.2.2-2 9/98 for PM10)
PM10 Adjustment Factor c	0.3	(dimensionless)	(AP-42 Table 13.2.2-2 9/98 for PM10)
Mean Vehicle Weight W	40	tons	assumed for aggregate trucks

Emissions Due to Soil Disturbance Activities

Operation Parameters (Calculated from User Inputs)

Grading duration per acre	26.2	hr/acre	
Bulldozer mileage per acre	1	VMT/acre	(Miles traveled by bulldozer during grading)
Construction VMT per day	7	VMT/day	
Construction VMT per acre	23.4	VMT/acre	(Travel on unpaved surfaces within site)

Equations Used (Corrected for PM10)

Operation	Empirical Equation	Units	AP-42 Section (5th Edition)
Bulldozing	$0.75(s^{1.5})/(M^{1.4})$	lbs/hr	Table 11.9-18.24, Overburden
Grading	$(0.60)(0.051)s^{2.0}$	lbs/VMT	Table 11.9-18.24
Vehicle Traffic	$[k(s/12)^{a} (W/3)^{b}/(M/0.2)^{c}] [(365-P)/365]$	lbs/VMT	Section 13.2.2

Source: Compilation of Air Pollutant Emission Factors, Vol. I, USEPA AP-42, Section 11.9 dated 7/98 and Section 13.2 dated 9/98

Calculation of PM10 Emission Factors for Each Operation

Operation	Emission Factor (mass/ unit)	Operation Parameter	Emission Factor (lbs/ acre)
Bulldozing	0.04 lbs/hr	26.2 hr/acre	1 lbs/acre
Grading	0.77 lbs/VMT	1 VMT/acre	0.8 lbs/acre
Vehicle Traffic	0.61 lbs/VMT	23.4 VMT/acre	14.2 lbs/acre

Emissions Due to Wind Erosion of Soil Piles and Exposed Graded Surface

Reference: Air Quality Thresholds of Significance, SCAQMD, 1994.

Soil Piles EF = 1.7(s/1.5)[(365 - H)/235](I/15)(J) = (s)(365 - H)(I)(J)/(3110.2941), p. A9-99.

Soil Piles EF = 4 lbs/day/acre covered by soil piles

Consider soil piles area fraction so that EF applies to graded area

Soil piles area fraction: 0.10 (Fraction of site area covered by soil piles)
Soil Piles EF = 0.4 lbs/day/acres graded

Graded Surface EF = 26.4 lbs/day/acre (recommended in CEQA Manual, p. A9-93).

Calculation of Annual PM10 Emissions

Source	Emission	Factor	Graded Acres/yr	Exposed days/yr	Emissions lbs/yr	Emissions tons/yr
Bulldozing	1	lbs/acre	10.06	NA	10	0.01
Grading	0.8	lbs/acre	10.06	NA	8	0.00
Vehicle Traffic	14.2	lbs/acre	10.06	NA	143	0.07
Erosion of Soil Piles	0.4	lbs/acre/day	10.06	90	362	0.18
Erosion of Graded Surface	26.4	lbs/acre/day	10.06	90	23,913	11.96
TOTAL					24,436	12.22

Soil Disturbance EF: 16 lbs/acre
Wind Erosion EF: 26.8 lbs/acre/day

Back calculate to get EF: 73.5 lbs/acre/grading day

445th Airlift Wing Conversion from C-141C to C-5 Aircraft at Wright-Patterson AFB, OH

Construction (Grading) Schedule

Estimate of time required to grade a specified area.

Input Parameters
Construction area: 10.06 acres/yr (from "Combustion" Worksheet)
Qty Equipment: 1.21 (calculated based on acres disturbed)

Assumptions.
Terrain is mostly flat.
An average of 6" soil is excavated from one half of the site and backfilled to the other half of the site; no soil is hauled off-site or borrowed.
200 hp bulldozers are used for site clearing.
300 hp bulldozers are used for stripping, excavation, and backfill.
Vibratory drum rollers are used for compacting.
Stripping, Excavation, Backfill and Compaction require an average of two passes each.
Excavation and Backfill are assumed to involve only half of the site.

Calculation of days required for one piece of equipment to grade the specified area.

Reference: Means Heavy Construction Cost Data, 6th Ed., R. S. Means, 1992.

Means Line No.	Operation	Description	Output	Units	Acres per equip-day)	equip-days per acre	Acres/yr	Equip-days per year
021 108 0550	Site Clearing	Dozer & rake, medium brush	0.6	acre/day	0.6	1.67	10.06	16.77
021 144 0300	Stripping	Topsoil & stockpiling, adverse soil	1,650	cu. yd/day	2.05	0.49	10.06	4.92
022 242 5220	Excavation	Bulk, open site, common earth, 150' haul	800	cu. yd/day	0.99	1.01	5.03	5.07
022 208 5220	Backfill	Structural, common earth, 150' haul	1,950	cu. yd/day	2.42	0.41	5.03	2.08
022 226 5020	Compaction	Vibrating roller, 6 " lifts, 3 passes	1,950	cu. yd/day	2.42	0.41	10.06	4.16
TOTAL								33.01

Calculation of days required for the indicated pieces of equipment to grade the designated acreage.

(Equip)(day)/yr: 33.01
Qty Equipment: 1.21
Grading days/yr: 33.01

Round to 33 grading days/yr

445th Airlift Wing Conversion from C-141C to C-5 Aircraft at Wright-Patterson AFB, OH

Construction Combustion Emissions
Activity from Table 2-2 of the January 2004 DOPAA:
Includes:

1	100% of Construct C-5 Scheduled Maintenance Hangar	52,302	ft2
2	100% Demolish Building 4028	30,000	ft2
3	100% of Alter C-5 Airfield Pavement (Phase II)	334,998	ft2
4	100% Alter Refueling Hydrants	6	pits
5	100% Alter Maintenance Shops, Hangar 4026	10,000	ft2
6	100% Construct C-5 Fuel Systems Maintenance Hangar	35,160	ft2
7	100% Alter Flight Simulator Facility	4,004	ft2
8	100% Construct C-5 Squadron Operations Facility	30,600	ft2
9	~~100% Demolish Building 4020.~~	~~21,340~~	~~ft2~~

Demolition cancelled, per Comment #7 on Preliminary Draft EA.

Construction Site Air Emissions
Combustion Emissions of ROG, NOx, SO2, CO and PM10 Due to Construction

User Inputs:

Total Building Area:	162,066	ft^2	(1, 2, 5, 6, 7, and 8
Total Paved Area:	335,004	ft^2	(3 and 4)
Total Disturbed Area:	11.90	acres	(1-9)
Construction Duration:	1.0	years	(assumed)
Annual Construction Activity:	230	days/yr	(assumed)

Results:[Average per Year Over the Construction Period]

	ROG	NOx	SO2	CO	PM10
Emissions, lbs/day	90.96	302.17	14.86	268.39	24.08
Emissions, tons/yr	10.46	34.75	1.71	30.87	2.77

Calculation of Unmitigated Emissions

Summary of Input Parameters

	ROG	NOx	SO2	CO	PM10
Total new acres disturbed:	11.90	11.90	11.90	11.90	11.90
Total new acres paved:	7.69	7.69	7.69	7.69	7.69
Total new building space, ft^2:	162,066	162,066	162,066	162,066	162,066
Total years:	1.00	1.00	1.00	1.00	1.00
Area graded, acres in 1 yr:	11.90	11.90	11.90	11.90	11.90
Area paved, acres in 1 yr:	7.69	7.69	7.69	7.69	7.69
Building space, ft^2 in 1 yr:	162,066	162,066	162,066	162,066	162,066

Annual Emissions by Source (lbs/day)

	ROG	NOx	SO2	CO	PM10
Grading Equipment	3.0	19.0	1.3	4.1	3.3
Asphalt Paving	2.0	0.0	0.0	0.0	0.0
Stationary Equipment	27.2	22.2	1.5	4.8	1.3
Mobile Equipment	25.9	260.9	12.1	259.5	19.4
Architectural Coatings (N	32.8	0.0	0.0	0.0	0.0
Total Emissions (lbs/day):	**91.0**	**302.2**	**14.9**	**268.4**	**24.1**

Emission Factors

Reference: Air Quality Thresholds of Significance, SMAQMD, 1994.

	SMAQMD Emission Factor				
Source	ROG	NOx	SO2 *	CO *	PM10
Grading Equipment	2.50E-01 lbs/acre/day	1.60E+00 lbs/acre/day	0.11 lbs/acre/day	0.35 lbs/acre/day	2.80E-01 lbs/acre/day
Asphalt Paving	2.62E-01 lbs/acre/day	NA	NA	NA	NA
Stationary Equipment	1.68E-04 lbs/day/ft^2	1.37E-04 lbs/day/ft^2	9.11E-06 lbs/day/ft^2	2.97E-05 lbs/day/ft^2	8.00E-06 lbs/day/ft^2
Mobile Equipment	1.60E-04 lbs/day/ft^2	1.61E-03 lbs/day/ft^2	7.48E-05 lbs/day/ft^2	0.0016 lbs/day/ft^2	1.20E-04 lbs/day/ft^2
Architectural Coatings (N	8.15E-02 lbs/day/ft	NA	NA	NA	NA

* Factors for grading equipment and stationary equipment are calculated from AP-42 for diesel engines using ratios with the NOx factors. Factors for mobile equipment are calculated from ratios with Mobile5a 2001 NOx emission factors for heavy duty trucks for each site.

445th Airlift Wing Conversion from C-141C to C-5 Aircraft at Wright-Patterson AFB, OH

Construction Fugitive Dust Emissions

Calculation of PM10 Emissions Due to Site Preparation (Uncontrolled).

User Input Parameters / Assumptions

Acres graded per year:	11.90	acres/yr	(From "Combustion" worksheet)
Grading days/yr:	39.04	days/yr	(From "Grading" worksheet)
Exposed days/yr:	90	assumed days/yr	graded area is exposed
Grading Hours/day:	8	hr/day	
Soil piles area fraction:	0.10	(assumed fraction of site area covered by soil piles)	
Soil percent silt, s:	8.5	%	(mean silt content; expected range: 0.5 to 23, AP-42 Table 13.2.2-1)
Soil percent moisture, M:	85	%	(NOAA 2003 http://www.cpc.noaa.gov/products/soilmst/drought_composite.html#CSMRP)
Annual rainfall days, p:	120	days/yr	rainfall exceeds 0.01 inch/day (AP-42 Fig 13.2.2-1)
Wind speed > 12 mph %, I:	12	%	Ave. of wind speed at Dayton, OH (ftp://ftp.wcc.nrcs.usda.gov/downloads/climate/windrose/ohio/da
Fraction of TSP, J:	0.5	(SCAQMD recommendation)	
Mean vehicle speed, S:	5	mi/hr	(On-site)
Dozer path width:	8	ft	
Qty construction vehicles:	1.43	vehicles	(From "Grading" worksheet)
On-site VMT/vehicle/day:	5	mi/veh/day	(Excluding bulldozer VMT during grading)
PM10 Adjustment Factor k	2.6	lb/VMT	(AP-42 Table 13.2.2-2 9/98 for PM10)
PM10 Adjustment Factor a	0.8	(dimensionless)	(AP-42 Table 13.2.2-2 9/98 for PM10)
PM10 Adjustment Factor b	0.4	(dimensionless)	(AP-42 Table 13.2.2-2 9/98 for PM10)
PM10 Adjustment Factor c	0.3	(dimensionless)	(AP-42 Table 13.2.2-2 9/98 for PM10)
Mean Vehicle Weight W	40	tons	assumed for aggregate trucks

Emissions Due to Soil Disturbance Activities

Operation Parameters (Calculated from User Inputs)

Grading duration per acre	26.2	hr/acre	
Bulldozer mileage per acre	1	VMT/acre	(Miles traveled by bulldozer during grading)
Construction VMT per day	7	VMT/day	
Construction VMT per acre	23.4	VMT/acre	(Travel on unpaved surfaces within site)

Equations Used (Corrected for PM10)

Operation	Empirical Equation	Units	AP-42 Section (5th Edition)
Bulldozing	$0.75(s^{1.5})/(M^{1.4})$	lbs/hr	Table 11.9-18.24, Overburden
Grading	$(0.60)(0.051)s^{2.0}$	lbs/VMT	Table 11.9-18.24
Vehicle Traffic	$[k(s/12)^{a} (W/3)^{b}/(M/0.2)^{c}] [(365-P)/365]$	lbs/VMT	Section 13.2.2

Source: Compilation of Air Pollutant Emission Factors, Vol. I, USEPA AP-42, Section 11.9 dated 7/98 and Section 13.2 dated 9/98

Calculation of PM10 Emission Factors for Each Operation

Operation	Emission Factor (mass/ unit)	Operation Parameter	Emission Factor (lbs/ acre)
Bulldozing	0.04 lbs/hr	26.2 hr/acre	1 lbs/acre
Grading	0.77 lbs/VMT	1 VMT/acre	0.8 lbs/acre
Vehicle Traffic	0.61 lbs/VMT	23.4 VMT/acre	14.2 lbs/acre

Emissions Due to Wind Erosion of Soil Piles and Exposed Graded Surface

Reference: Air Quality Thresholds of Significance, SCAQMD, 1994.

Soil Piles EF = 1.7(s/1.5)[(365 - H)/235](I/15)(J) = (s)(365 - H)(I)(J)/(3110.2941), p. A9-99.

Soil Piles EF = 4 lbs/day/acre covered by soil piles

Consider soil piles area fraction so that EF applies to graded area

Soil piles area fraction: 0.10 (Fraction of site area covered by soil piles)
Soil Piles EF = 0.4 lbs/day/acres graded

Graded Surface EF = 26.4 lbs/day/acre (recommended in CEQA Manual, p. A9-93).

Calculation of Annual PM10 Emissions

Source	Emission Factor	Graded Acres/yr	Exposed days/yr	Emissions lbs/yr	Emissions tons/yr
Bulldozing	1 lbs/acre	11.90	NA	12	0.01
Grading	0.8 lbs/acre	11.90	NA	10	0.00
Vehicle Traffic	14.2 lbs/acre	11.90	NA	169	0.08
Erosion of Soil Piles	0.4 lbs/acre/day	11.90	90	428	0.21
Erosion of Graded Surface	26.4 lbs/acre/day	11.90	90	28,277	14.14
TOTAL				28,896	14.45

Soil Disturbance EF: 16 lbs/acre
Wind Erosion EF: 26.8 lbs/acre/day

Back calculate to get EF: 62.2 lbs/acre/grading day

445th Airlift Wing Conversion from C-141C to C-5 Aircraft at Wright-Patterson AFB, OH

Construction (Grading) Schedule

Estimate of time required to grade a specified area.

Input Parameters
Construction area 11.90 acres/yr (from "Combustion" Worksheet)
Qty Equipment: 1.43 (calculated based on acres disturbed)

Assumptions.
Terrain is mostly flat.
An average of 6" soil is excavated from one half of the site and backfilled to the other half of the site; no soil is hauled off-site or borrowed.
200 hp bulldozers are used for site clearing.
300 hp bulldozers are used for stripping, excavation, and backfill.
Vibratory drum rollers are used for compacting.
Stripping, Excavation, Backfill and Compaction require an average of two passes each.
Excavation and Backfill are assumed to involve only half of the site.

Calculation of days required for one piece of equipment to grade the specified area.

Reference: Means Heavy Construction Cost Data, 6th Ed., R. S. Means, 1992.

Means Line No.	Operation	Description	Output	Units	Acres per equip-day)	equip-days per acre	Acres/yr	Equip-days per year
021 108 0550	Site Clearing	Dozer & rake, medium brush	0.6	acre/day	0.6	1.67	11.90	19.84
021 144 0300	Stripping	Topsoil & stockpiling, adverse soil	1,650	cu. yd/day	2.05	0.49	11.90	5.82
022 242 5220	Excavation	Bulk, open site, common earth, 150' haul	800	cu. yd/day	0.99	1.01	5.95	6.00
022 208 5220	Backfill	Structural, common earth, 150' haul	1,950	cu. yd/day	2.42	0.41	5.95	2.46
022 226 5020	Compaction	Vibrating roller, 6 " lifts, 3 passes	1,950	cu. yd/day	2.42	0.41	11.90	4.92
TOTAL								39.04

Calculation of days required for the indicated pieces of equipment to grade the designated acreage.

(Equip)(day)/yr: 39.04
Qty Equipment: 1.43
Grading days/yr: 39.04

Round to 39 grading days/yr

445th Airlift Wing Conversion from C-141C to C-5 Aircraft at Wright-Patterson AFB, OH

Construction Combustion Emissions
Activity from Table 2-2 of the January 2004 DOPAA:
Includes:

1	100% of Alter Building 4014	45,390 ft2
2	100% of Demolish 4042	33,300 ft2

Construction Site Air Emissions
Combustion Emissions of ROG, NOx, SO2, CO and PM10 Due to Construction

User Inputs:

Total Building Area:	78,690	ft^2	(1 and 2)
Total Paved Area:	0	ft^2	N/A
Total Disturbed Area:	1.81	acres	(1 and 2)
Construction Duration:	1.0	years	(assumed)
Annual Construction Activity:	230	days/yr	(assumed)

Results:[Average per Year Over the Construction Period]

	ROG	NOx	SO2	CO	PM10
Emissions, lbs/day	49.12	140.36	6.79	128.94	10.58
Emissions, tons/yr	5.65	16.14	0.78	14.83	1.22

Calculation of Unmitigated Emissions

Summary of Input Parameters

	ROG	NOx	SO2	CO	PM10
Total new acres disturbed:	1.81	1.81	1.81	1.81	1.81
Total new acres paved:	0.00	0.00	0.00	0.00	0.00
Total new building space, ft^2:	78,690	78,690	78,690	78,690	78,690
Total years:	1.00	1.00	1.00	1.00	1.00
Area graded, acres in 1 yr:	1.81	1.81	1.81	1.81	1.81
Area paved, acres in 1 yr:	0.00	0.00	0.00	0.00	0.00
Building space, ft^2 in 1 yr:	78,690	78,690	78,690	78,690	78,690

Annual Emissions by Source (lbs/day)

	ROG	NOx	SO2	CO	PM10
Grading Equipment	0.5	2.9	0.2	0.6	0.5
Asphalt Paving	0.0	0.0	0.0	0.0	0.0
Stationary Equipment	13.2	10.8	0.7	2.3	0.6
Mobile Equipment	12.6	126.7	5.9	126.0	9.4
Architectural Coatings (	22.9	0.0	0.0	0.0	0.0
Total Emissions (lbs/day):	**49.1**	**140.4**	**6.8**	**128.9**	**10.6**

Emission Factors

Reference: Air Quality Thresholds of Significance, SMAQMD, 1994.

	SMAQMD Emission Factor				
Source	ROG	NOx	SO2 *	CO *	PM10
Grading Equipment	2.50E-01 lbs/acre/day	1.60E+00 lbs/acre/day	0.11 lbs/acre/day	0.35 lbs/acre/day	2.80E-01 lbs/acre/day
Asphalt Paving	2.62E-01 lbs/acre/day	NA	NA	NA	NA
Stationary Equipment	1.68E-04 lbs/day/ft^2	1.37E-04 lbs/day/ft^2	9.11E-06 lbs/day/ft^2	2.97E-05 lbs/day/ft^2	8.00E-06 lbs/day/ft^2
Mobile Equipment	1.60E-04 lbs/day/ft^2	1.61E-03 lbs/day/ft^2	7.48E-05 lbs/day/ft^2	0.0016 lbs/day/ft^2	1.20E-04 lbs/day/ft^2
Architectural Coatings (	8.15E-02 lbs/day/ft	NA	NA	NA	NA

* Factors for grading equipment and stationary equipment are calculated from AP-42 for diesel engines using ratios with the NOx factors. Factors for mobile equipment are calculated from ratios with Mobile5a 2001 NOx emission factors for heavy duty trucks for each site.

445th Airlift Wing Conversion from C-141C to C-5 Aircraft at Wright-Patterson AFB, OH

Construction Fugitive Dust Emissions

Calculation of PM10 Emissions Due to Site Preparation (Uncontrolled).

User Input Parameters / Assumptions

Acres graded per year:	1.81	acres/yr	(From "Combustion" worksheet)
Grading days/yr:	39.04	days/yr	(From "Grading" worksheet)
Exposed days/yr:	90	assumed days/yr graded area is exposed	
Grading Hours/day:	8	hr/day	
Soil piles area fraction:	0.10	(assumed fraction of site area covered by soil piles)	
Soil percent silt, s:	8.5	%	(mean silt content; expected range: 0.5 to 23, AP-42 Table 13.2.2-1)
Soil percent moisture, M:	85	%	(NOAA 2003 http://www.cpc.noaa.gov/products/soilmst/drought_composite.html#CSMRP)
Annual rainfall days, p:	120	days/yr	rainfall exceeds 0.01 inch/day (AP-42 Fig 13.2.2-1)
Wind speed > 12 mph %, I:	12	%	Ave. of wind speed at Dayton, OH (ftp://ftp.wcc.nrcs.usda.gov/downloads/climate/windrose/ohio/dayton/)
Fraction of TSP, J:	0.5	(SCAQMD recommendation)	
Mean vehicle speed, S:	5	mi/hr	(On-site)
Dozer path width:	8	ft	
Qty construction vehicles:	1.43	vehicles	(From "Grading" worksheet)
On-site VMT/vehicle/day:	5	mi/veh/day	(Excluding bulldozer VMT during grading)
PM10 Adjustment Factor k	2.6	lb/VMT	(AP-42 Table 13.2.2-2 9/98 for PM10)
PM10 Adjustment Factor a	0.8	(dimensionless)	(AP-42 Table 13.2.2-2 9/98 for PM10)
PM10 Adjustment Factor b	0.4	(dimensionless)	(AP-42 Table 13.2.2-2 9/98 for PM10)
PM10 Adjustment Factor c	0.3	(dimensionless)	(AP-42 Table 13.2.2-2 9/98 for PM10)
Mean Vehicle Weight W	40	tons	assumed for aggregate trucks

Emissions Due to Soil Disturbance Activities

Operation Parameters (Calculated from User Inputs)

Grading duration per acre	172.9	hr/acre	
Bulldozer mileage per acre	1	VMT/acre	(Miles traveled by bulldozer during grading)
Construction VMT per day	7	VMT/day	
Construction VMT per acre	154.3	VMT/acre	(Travel on unpaved surfaces within site)

Equations Used (Corrected for PM10)

Operation	Empirical Equation	Units	AP-42 Section (5th Edition)
Bulldozing	$0.75(s^{1.5})/(M^{1.4})$	lbs/hr	Table 11.9-18.24, Overburden
Grading	$(0.60)(0.051)s^{2.0}$	lbs/VMT	Table 11.9-18.24
Vehicle Traffic	$[k(s/12)^{a} (W/3)^{b}/(M/0.2)^{c}] [(365-P)/365]$	lbs/VMT	Section 13.2.2

Source: Compilation of Air Pollutant Emission Factors, Vol. I, USEPA AP-42, Section 11.9 dated 7/98 and Section 13.2 dated 9/98

Calculation of PM10 Emission Factors for Each Operation

Operation	Emission Factor (mass/ unit)	Operation Parameter	Emission Factor (lbs/ acre)
Bulldozing	0.04 lbs/hr	172.9 hr/acre	6.9 lbs/acre
Grading	0.77 lbs/VMT	1 VMT/acre	0.8 lbs/acre
Vehicle Traffic	0.61 lbs/VMT	154.3 VMT/acre	93.7 lbs/acre

Emissions Due to Wind Erosion of Soil Piles and Exposed Graded Surface

Reference: Air Quality Thresholds of Significance, SCAQMD, 1994.

Soil Piles EF = 1.7(s/1.5)[(365 - H)/235](I/15)(J) = (s)(365 - H)(I)(J)/(3110.2941), p. A9-99.

Soil Piles EF = 4 lbs/day/acre covered by soil piles

Consider soil piles area fraction so that EF applies to graded area

Soil piles area fraction: 0.10 (Fraction of site area covered by soil piles)
Soil Piles EF = 0.4 lbs/day/acres graded

Graded Surface EF = 26.4 lbs/day/acre (recommended in CEQA Manual, p. A9-93).

Calculation of Annual PM10 Emissions

Source	Emission Factor	Graded Acres/yr	Exposed days/yr	Emissions lbs/yr	Emissions tons/yr
Bulldozing	6.9 lbs/acre	1.81	NA	12	0.01
Grading	0.8 lbs/acre	1.81	NA	1	0.00
Vehicle Traffic	93.7 lbs/acre	1.81	NA	169	0.08
Erosion of Soil Piles	0.4 lbs/acre/day	1.81	90	65	0.03
Erosion of Graded Surface	26.4 lbs/acre/day	1.81	90	4,292	2.15
TOTAL				4,540	2.27

Soil Disturbance EF: 101.4 lbs/acre
Wind Erosion EF: 26.8 lbs/acre/day

Back calculate to get EF: 64.4 lbs/acre/grading day

445th Airlift Wing Conversion from C-141C to C-5 Aircraft at Wright-Patterson AFB, OH

Construction (Grading) Schedule

Estimate of time required to grade a specified area.

Input Parameters

Construction area: 11.90 acres/yr (from "Combustion" Worksheet)
Qty Equipment: 1.43 (calculated based on acres disturbed)

Assumptions.

Terrain is mostly flat.
An average of 6" soil is excavated from one half of the site and backfilled to the other half of the site; no soil is hauled off-site or borrowed.
200 hp bulldozers are used for site clearing.
300 hp bulldozers are used for stripping, excavation, and backfill.
Vibratory drum rollers are used for compacting.
Stripping, Excavation, Backfill and Compaction require an average of two passes each.
Excavation and Backfill are assumed to involve only half of the site.

Calculation of days required for one piece of equipment to grade the specified area.

Reference: Means Heavy Construction Cost Data, 6th Ed., R. S. Means, 1992.

Means Line No.	Operation	Description	Output	Units	Acres per equip-day)	equip-days per acre	Acres/yr	Equip-days per year
021 108 0550	Site Clearing	Dozer & rake, medium brush	0.6	acre/day	0.6	1.67	11.90	19.84
021 144 0300	Stripping	Topsoil & stockpiling, adverse soil	1,650	cu. yd/day	2.05	0.49	11.90	5.82
022 242 5220	Excavation	Bulk, open site, common earth, 150' haul	800	cu. yd/day	0.99	1.01	5.95	6.00
022 208 5220	Backfill	Structural, common earth, 150' haul	1,950	cu. yd/day	2.42	0.41	5.95	2.46
022 226 5020	Compaction	Vibrating roller, 6 " lifts, 3 passes	1,950	cu. yd/day	2.42	0.41	11.90	4.92
TOTAL								39.04

Calculation of days required for the indicated pieces of equipment to grade the designated acreage.

(Equip)(day)/yr: 39.04
Qty Equipment: 1.43
Grading days/yr: 39.04

Round to	39 grading days/yr

Airfield Operation Emissions (LTOs and TGOs)

Discussion of Airfield Operations

Of the stationary and mobile air emissions sources at Wright-Patterson AFB the source category most impacted by the Proposed Action will be airfield operations. Airfield operations include aircraft operated by 445 AW, 47 ALW, Aero Club, and transient aircraft that use the Wright-Patterson AFB Airfield.

Airfield operations include landings and takeoffs (LTOs) , which consist of
"Idle Out" as the aircraft rolls out to the runway and queues for takeoff;
"Takeoff" which is a short burst of full-power acceleration down the runway.
"Climbout" which is the climb from the runway to 3000 ft AGL (the 'mixing height' altitude above which emissions have little or no impact on ground-level air quality);
"Approach" which is the descent from 3000 ft to the runway, and braking;
"Idle In" which is the taxi back to the apron or terminal.

Touch-and-Go (TGO) operations are practice landings and takeoffs. These operations are characterized in exactly the same way as LTOs, but with no idle time. Because the airplanes do not slow to a stop, there may also be no "takeoff" thrust required, only "approach" and "climbout".

Assumptions Used in Emissions Estimates

The methodology and times-in-mode (TIM) minutes at each throttle setting used in this analysis were obtained from the "Air Emissions Inventory Guidance Document for Mobile Sources at Air Force Installations" prepared by Air Quality Branch Environmental Analysis Division AFIERA. IERA-RS-BR-SR-2001-0010 January 2002.

"Trim tests" is the generic term used here to refer to all on-wing testing of engines. Actual trim tests are tests done to balance the throttles when the computer indicates a thrust imbalance or when an engine is replaced. Other on-wing tests include leak checks after routine or unscheduled service, isochronal inspections which are scheduled activities based on cycles and flying hours, and other scheduled and unscheduled maintenance activities. The Air Force's Air Conformity Assessment Model (ACAM) assumes 28 on-wing engine tests per year per aircraft, with time-in-mode designed to represent the spectrum of different on-wing tests. ACAM assumes these same values for all aircraft, unless the user keys in site-specific data.
Interviews with C-141 and C-5 experts did not result in a consensus of a typical annual average test schedule, However, there was consensus that 28 tests and a total of 2-3 hours per month of engine-running testing, as assumed by the ACAM model, is a very high estimate for a C-141 or a C-5.
A review of the computerized maintenance reports indicated that these reports track the labor hours expended performing these tasks, but apparently do not track the engine operating hours during these inspections. Therefore, for this analysis, we have used the default time-in-mode profile from the ACAM model, but have assumed 16, rather than 24 such tests per year per aircraft. The same test schedule has been assumed for

both the C-5 and the C-141.

APU operation depends on the outside temperature and whether AGE equipment to provide compressed air and electricity is available in proximity to the aircraft. For this analysis, we have conservatively assumed that each airplane operates an APU for one hour before each takeoff and 1/2 hour after each landing. This assumption will tend to double count a few pounds of emissions that are attributed to AGE equipment.

Aircraft Descriptions and Airfield Activity Data

C-141C Total airfield operations by year.

			2004	2005	2006	2007
16	assigned aircraft	LTO Ops	1,996	1,497	428	0
4	engines each	TGO Ops	6,642	4,982	1,423	0
TF33-PW-7A	engine model	Total Ops	8,638	6,479	1,851	0
		APU Cycles	998	749	214	0
GTCP85-106	APU model	Trim Tests	256	168	48	0

Current Operations LTO/TGO data (in the 2004 column) are actually 5-year average data, 1999-2003. This was done to include pre-9/11 operations.
A review flight operations data for three AFRC bases indicated that in all three cases, flight hours increased dramatically after 9/11, but home station airfield operations reduced slightly. This is because there has been less need for home station training sorties, and far fewer home station TGOs, in 2002 and 2003.
Since 9/11, airfield activity has been highly variable from month-to-month, and has not reflected operations that could be considered "typical". Therefore the 5-year average was used to create a scenario more representative of AFRC operations at Wright-Patterson AFB.
LTO data are the 5-year average Home Station Launch number from the Wright Patterson AFRC maintenance database. (ref: LtCol Anne Gunter, 445 AW/CCX, 5/3/04)
TGO data are the 5-year average of [Landings] - [Sorties] as recorded in the REMIS database maintained by HQ AFRC. (ref: Donald Cook, AFRC/DOTF 4/7/04)

C-5 A/B Total airfield operations by year.

			2004	2005	2006	2007
10	assigned aircraft	LTO Ops	0	46	555	1,000
4	engines each	TGO Ops	0	154	1,845	3,000
TF39-GE-1C	engine model	Total Ops	0	200	2,400	4,000
		APU Cycles	0	23	277	500
GTCP165-1B/2	APU model	Trim Tests	0	8	96	160

Projected C-5 Ops are based on a review of AFRC C-5 operations over the past 5 years at Lackland AFB, TX and Westover AFB, MA.
TGO operations were higher prior to 9/11 than after 9/11. The highest TGO value calculated (Lackland, pre 9/11) was 128 TGO cycles per plane per year.
A TGO count of 150 per plane per year is assumed for this analysis.
LTO Operations: There is some uncertainty in the LTO counts for the AFRC C-5 bases, because the sortie counts do not break out home station launches from remote airfield launches. If we assume that the C-5 home station launch fractions at the other bases were comperable to the C-141 home station launch fractions at W-P AFB (50% pre-9/11 and 40% post 9/11), then the post 9/11 C-5 LTOs were slightly higher than the pre 9/11 LTOs, averaging about 45 LTOs per plane per year, compared to C-5 LTO counts in the 35-40 range prior to 9/11. For this estimate, 50 Home station launches per C-5 per year are used.
(Interim year C-5 operations are scaled to aircraft counts. See Target Year LTO/TGO Calculations at the foot of this worksheet)

Emission Factors, Time-In-Mode, and Fuel Consumption Rates (per engine)

C-141C

Fuel (thrust)		Fuel (Mlb/min)	LTO TIM (minutes)	TGO (minutes)	Trim Test (minutes)	NOx (lb/Mlb)	HC (lb/Mlb)	CO (lb/Mlb)	SO2 (lb/Mlb)	PM10 (lb/Mlb)	lbs/hr	
11.6%	Taxi Out	0.01758	9.2		9.0	1.50	131.16	136.96	1.70	6.13	1,055	Idle
100.0%	Takeoff	0.15180	0.4	0.4	9.0	11.49	0.25	1.19	1.70	2.93	9,108	Military
83.8%	Climbout	0.12720	1.2	1.2	6.8	8.47	0.39	2.96	1.70	5.29	7,632	Intermediate
43.8%	Approach	0.06643	5.1	5.1	20.2	6.22	3.62	14.6	1.70	5.46	3,986	Approach
11.6%	Taxi In	0.01758	6.7			1.50	131.16	136.96	1.70	6.13	1,055	Idle

C-5 A/B

Fuel (thrust)		Fuel (Mlb/min)	LTO TIM (minutes)	TGO (minutes)	Trim Test (minutes)	NOx (lb/Mlb)	HC (lb/Mlb)	CO (lb/Mlb)	SO2 (lb/Mlb)	PM10 (lb/Mlb)	lbs/hr	
10.4%	Taxi Out	0.02413	9.2		9.0	3.36	16.43	58.21	1.70	2.75	1,448	Idle
100.0%	Takeoff	0.23102	0.4	0.4	9.0	32.66	0.00	1.28	1.70	1.18	13,861	Military
90.5%	Climbout	0.20902	1.2	1.2	6.8	28.16	0.00	1.63	1.70	0.89	12,541	Intermediate
36.1%	Approach	0.08333	5.1	5.1	20.2	24.72	0.67	0.77	1.70	1.19	5,000	Approach
10.4%	Taxi In	0.02413	6.7			3.36	16.43	58.21	1.70	2.75	1,448	Idle

References:

Emission factors & TIM for C-141 from Tables 3-3 and 3-7, AFIERA AEI Guidance for Mobile Sources, January 2002
Emission factors & TIM for C-5 from Tables 3-3 and 3-7, AFIERA AEI Guidance for Mobile Sources, January 2002.
These TIMs assume an average mixing height of 3000 ft., and are the default values for USAF transport aircraft.

NOTE: A significant adjustment was made to the published fuel flow rate for the Approach thrust mode for the C-5 Aircraft. The AF IERA references suggests a fuel flow of 10,477 lb/hr per engine during Approach. This is an unusually high fuel consumption rate for this flight mode, relative to other aircraft. Interviews with C-5 pilots confirmed that the suggested value is indeed unrealistically high, and a typical fuel flow rate for a C-5 on approach is approximately 5000 lb/hr per engine.
Ref: April 2004 interviews with LtCol S. Elmer Whittier Jr., Westover AFB; Major Wagner, Travis AFB; and Major Fred McMahon, Lackland AFB, Major Neal Thompson, Robins AFB, and CMSgt Mike Rynes, Scott AFB.
Although the fuel flow rate was corrected to correspond to the typical C-5 Approach thrust level, the emission factors have not been adjusted to correspond to this thrust level. The emission factors listed for Approach mode are believed to over-estimate NOx and to slightly under-estimate CO and VOC emissions. However, detailed data to support adjustments to these emissions factors were not available in the literature.

SOx emission factors use an sulfur content from Table 3-6 of the AF IERA document, 0.085% wt for East/Central US JP-8.

Each set of LTO TIMs and TGO TIMs listed in the tables above corresponds to two ops: a complete landing and takeoff or a complete touch-and-go.

APU Emission Factors (@ 100% load)

		Fuel (Mlb/min)	LTO TIM (minutes)			NOx (lb/Mlb)	HC (lb/Mlb)	CO (lb/Mlb)	SO2 (lb/Mlb)	PM10 (lb/Mlb)	lbs/hr
C-141C APU	GTCP85-106	0.00450	90			4.73	0.02	7.75	1.70	0.45	270.0

C-5 A/B APU	GTCP165-1B/2	0.00455	90			4.52	0.24	13.93	1.70	0.48	273.0

Emission factors from Table 3-4, AFIERA AEI Guidance for Mobile Sources, January 2002. The factor for a GTCP85-180 was used because no factors specific to the GTCP85-106 were found in the literature.
SOx emission factors use an sulfur content from Table 3-6 of the AF IERA document, 0.085% wt for East/Central US JP-8.

Calculations

LTO/TGO lbs = (# engines)*(EF lb/Mlb fuel)*(fuel Mlb/min)*(TIM minutes)(total Ops/2) summed over all power settings
Trim Tests lbs = (# engines)*(EF lb/Mlb fuel)*(fuel Mlb/min)*(TIM minutes)(trim tests) summed over all power settings
APU lbs = (1 APU)*(EF lb/Mlb fuel)*(fuel Mlb/min)*(TIM minutes)(total LTO cycles)

Current Airfield Operation Emissions Estimates (Baseline)

C-141C **Current Emissions Estimates**

	NOx (lbs)	HC (lbs)	CO (lbs)	SO2 (lbs)	PM (lbs)
LTOs	18,033	151,577	174,695	5,645	18,160
TGOs	54,437	17,285	72,673	12,470	37,664
Trim Tests	32,367	26,924	46,543	6,496	17,281
APU	1,912	8	3,132	687	182
Totals	106,749	195,794	297,044	25,297	73,286

C-5 A/B **Current Emissions Estimates**

	NOx (lbs)	HC (lbs)	CO (lbs)	SO2 (lbs)	PM (lbs)
LTOs	0	0	0	0	0
TGOs	0	0	0	0	0
Trim Tests	0	0	0	0	0
APU	0	0	0	0	0
Totals	0	0	0	0	0

Grand Total **Current Emissions Estimates**

	NOx (lbs)	HC (lbs)	CO (lbs)	SO2 (lbs)	PM (lbs)
LTOs	18,033	113,683	131,021	4,233	13,620
TGOs	54,437	17,285	72,673	12,470	37,664
Trim Tests	32,367	26,924	46,543	6,496	17,281
APU	1,912	8	3,132	687	182
Totals	106,749	195,794	297,044	25,297	73,286
Total Tons per Year	**53.37**	**97.90**	**148.52**	**12.65**	**36.64**

2005 Airfield Operation Emissions Estimates (Proposed)

C-141C **2005 Emissions Estimates**

	NOx (lbs)	HC (lbs)	CO (lbs)	SO2 (lbs)	PM (lbs)
LTOs	13,525	113,683	131,021	4,233	13,620
TGOs	40,828	12,964	54,505	9,352	28,248
Trim Tests	21,241	17,669	30,544	4,263	11,340
APU	1,434	6	2,349	515	136
Totals	77,027	144,322	218,419	18,364	53,345

C-5 A/B **2005 Emissions Estimates**

	NOx (lbs)	HC (lbs)	CO (lbs)	SO2 (lbs)	PM (lbs)
LTOs	2,022	609	2,143	181	175
TGOs	6,332	88	263	402	258
Trim Tests	4,809	150	605	294	202
APU	43	2	132	16	5
Totals	13,205	849	3,143	893	639

Grand Total **2005 Emissions Estimates**

	NOx (lbs)	HC (lbs)	CO (lbs)	SO2 (lbs)	PM (lbs)
LTOs	15,547	114,292	133,165	4,414	13,795
TGOs	47,160	13,051	54,767	9,754	28,506
Trim Tests	26,049	17,819	31,149	4,557	11,543
APU	1,477	8	2,481	531	141
Totals	90,232	145,171	221,563	19,256	53,984
Total Tons per Year	**45.12**	**72.59**	**110.78**	**9.63**	**26.99**

2006 Airfield Operation Emissions Estimates (Proposed)

C-141C **2006 Emissions Estimates**

	NOx (lbs)	HC (lbs)	CO (lbs)	SO2 (lbs)	PM (lbs)
LTOs	3,864	32,481	37,435	1,210	3,891
TGOs	11,665	3,704	15,573	2,672	8,071
Trim Tests	6,069	5,048	8,727	1,218	3,240
APU	410	2	671	147	39
Totals	22,008	41,235	62,406	5,247	15,241

C-5 A/B **2006 Emissions Estimates**

	NOx (lbs)	HC (lbs)	CO (lbs)	SO2 (lbs)	PM (lbs)
LTOs	24,264	7,308	25,722	2,172	2,100
TGOs	75,984	1,051	3,153	4,820	3,093
Trim Tests	57,704	1,803	7,264	3,526	2,426
APU	513	27	1,582	193	55
Totals	158,465	10,190	37,721	10,711	7,674

Grand Total **2006 Emissions Estimates**

	NOx (lbs)	HC (lbs)	CO (lbs)	SO2 (lbs)	PM (lbs)
LTOs	28,128	39,789	63,157	3,382	5,991
TGOs	87,649	4,755	18,726	7,492	11,164
Trim Tests	63,773	6,852	15,991	4,744	5,667
APU	923	29	2,253	340	93
Totals	180,473	51,425	100,127	15,958	22,915
Total Tons per Year	**90.24**	**25.71**	**50.06**	**7.98**	**11.46**

2007 Airfield Operation Emissions Estimates (Proposed)

C-141C **2007 Emissions Estimates**

	NOx (lbs)	HC (lbs)	CO (lbs)	SO2 (lbs)	PM (lbs)
LTOs	0	0	0	0	0
TGOs	0	0	0	0	0
Trim Tests	0	0	0	0	0
APU	0	0	0	0	0
Totals	0	0	0	0	0

C-5 A/B **2007 Emissions Estimates**

	NOx (lbs)	HC (lbs)	CO (lbs)	SO2 (lbs)	PM (lbs)
LTOs	43,753	13,179	46,381	3,917	3,786
TGOs	123,523	1,709	5,126	7,836	5,028
Trim Tests	96,173	3,006	12,107	5,876	4,044
APU	925	49	2,852	348	98
Totals	264,374	17,942	66,467	17,977	12,957

Grand Total **2007 Emissions Estimates**

	NOx (lbs)	HC (lbs)	CO (lbs)	SO2 (lbs)	PM (lbs)
LTOs	43,753	13,179	46,381	3,917	3,786
TGOs	123,523	1,709	5,126	7,836	5,028
Trim Tests	96,173	3,006	12,107	5,876	4,044
APU	925	49	2,852	348	98
Totals	264,374	17,942	66,467	17,977	12,957
Total Tons per Year	**132.19**	**8.97**	**33.23**	**8.99**	**6.48**

Net Change: Current - 2005 tpy	**-8.26**	**-25.31**	**-37.74**	**-3.02**	**-9.65**
Net Change: Current - 2006 tpy	**36.86**	**-72.18**	**-98.46**	**-4.67**	**-25.19**
Net Change: Current - 2007 tpy	**78.81**	**-88.93**	**-115.29**	**-3.66**	**-30.16**

Estimates of Fleet and LTO/TGO Airfield Operations by Year

The only emissions that are expected to change appreciably as a result of the Proposed Action are Airfield Operations and Construction emissions. Airfield ops and associate emissions during the years from 2003 to 2006 are expected to scale proportionally to the number of aircraft based in any quarter. This should be conservative because it is unlikely that every aircraft will have crew and support ready for a full training schedule the day it arrives.

Table 2-3 of the January 2004 DOPAA indicates that although the number of based aircraft is being reduced by 29%, the number of airfield operations is expected to be reduced by only 10.8%. The proportion of landing and takeoff operations to touch-and-go operations is assumed to remain approximately constant.

The following Table mirrors the drawdown/buildup schedule from Table 2-1 of the January 2004 DOPAA, and combines this with the overall airfield operations 10.8% projected reduction associated with the Proposed Action to estimate the number of C-141 and C-5 airfield operations for each calendar year.

C-141 Drawdown/C-5 Ramp-Up					Projected Operations by CY			
Qtr/FY	Qtr/CY	C-141	C-5	Total	Avg C-141	C- 141 Ops	Avg C-5s	C-5 Ops
1/05	4/04	16	0	16	16	8,638	0	0
2/05	1/05	14	0	14				
3/05	2/05	12	0	12				
4/05	3/05	8	0	8				
1/06	4/05	8	2	10	10.5	6,479	0.5	200
2/06	1/06	8	4	12				
3/06	2/06	4	5	9				
4/06	3/06	0	6	6				
1/07	4/06	0	8	8	3.0	1,851	6	2,400
2/07	1/07	0	9	9				
3/07	2/07	0	10	10				
4/07	3/07	0	10	10				
1/08	4/07	0	10	10	0.0	0	10	4,000

Ref: Table 2-1, DOPPA for the Wright-Patterson AFB C-141C to C-5 Conversion, January 2004
Note that the total number of aircraft stationed at Wright-Patterson is actually reducing from 16 to 11 (16 primary assigned aircraft (PAA) plus 2 backup aircraft inventory (BAI) to 10 PAA plus 1 BAI)

Airfield Ops Emissions Estimates for Target Years

Current

Model	Year	Total Ops	NOx (tons)	HC (tons)	CO (tons)	SO2 (tons)	PM (tons)	Notes	
C-141C	Current	8,638	53.37	97.90	148.52	12.65	36.64	16	aircraft (avg)
C-5 A/B	Current	0	0.00	0.00	0.00	0.00	0.00	0	aircraft (avg)
Total for Current			**53.37**	**97.90**	**148.52**	**12.65**	**36.64**		

CY2005

Model	Year	Estimated Ops	NOx (tons)	HC (tons)	CO (tons)	SO2 (tons)	PM (tons)	Notes	
C-141C	2005	6,479	38.51	72.16	109.21	9.18	26.67	10.5	aircraft (avg)
C-5 A/B	2005	200	6.60	0.42	1.57	0.45	0.32	0.5	aircraft (avg)
Total for 2005			**45.12**	**72.59**	**110.78**	**9.63**	**26.99**		

CY2006

Model	Year	Estimated Ops	NOx (tons)	HC (tons)	CO (tons)	SO2 (tons)	PM (tons)	Notes	
C-141C	2006	1,851	11.00	20.62	31.20	2.62	7.62	3.0	aircraft (avg)
C-5 A/B	2006	2,400	79.23	5.10	18.86	5.36	3.84	6.0	aircraft (avg)
Total for 2006			**90.24**	**25.71**	**50.06**	**7.98**	**11.46**		

CY2007

Model	Year	Estimated Ops	NOx (tons)	HC (tons)	CO (tons)	SO2 (tons)	PM (tons)	Notes	
C-141C	2007	0	0.00	0.00	0.00	0.00	0.00	0.0	aircraft (avg)
C-5 A/B	2007	4,000	132.19	8.97	33.23	8.99	6.48	10.0	aircraft (avg)
Total for 2007			**132.19**	**8.97**	**33.23**	**8.99**	**6.48**		

Net Emissions Changes for Aircraft Operations, Relative to Current Operations

Deltas for Airfield Ops			NOx (tons)	HC (tons)	CO (tons)	SO2 (tons)	PM (tons)
	2005		-8.26	-25.31	-37.74	-3.02	-9.65
	2006		36.86	-72.18	-98.46	-4.67	-25.19
	2007		78.81	-88.93	-115.29	-3.66	-30.16

WRIGHT-PATTERSON AFB - BASELINE AND PROPOSED ACTION AGE EMISSIONS

Different AGE devices have slightly different emission characteristics (factors). However, because this estimate relies on dispensing tank throughputs to estimate AGE emissions for the entire AGE fleet, typical IC engine emission factors for small diesel IC engines are used to represent the entire AGE fleet collectively.

The 445 AGE fleet has converted to the exclusive use of JP-8 rather than diesel fuel. Because JP-8 is physically similar to diesel fuel, emission factors derived from the use of diesel fuel in IC engines are used to estimate emissions. This methodology is consistant with Air Force guidance published in "Air Emissions Inventory Guidance Document for Mobile Sources at Air Force Installations", IERA-RS-BR-SR-2001-0010, January 2002.

The thermal efficiency for all gasoline and diesel internal combustion engines was taken to be **36.4%**. This is the default efficiency used by U.S. EPA in converting emission factors used in AP-42 Sections 3.3 and 3.4, dated 10/96. This is also consistant with the methodology used in previous AFRC air emission inventories.

Emission Factors for IC Engines

Pollutant	CAS #	Emission Factors[a] (lb/MMBtu)			
		DIESEL	MOGAS	LARGE DIESEL	NG/ PROPANE[c]
PM		0.31000	0.10000	0.06970	0.00991
PM_{10}		0.31000	0.10000	0.05730	0.01940
$PM_{2,5}$		0.31000	0.10000	0.05500	0.01940
Carbon Monoxide	630-08-0	0.95000	62.70000	0.85000	3.51000
NOx		4.41000	1.63000	3.20000	2.27000
SOx[b]		0.05050	0.08400	0.05050	0.00059
Total Organic Compounds		0.36000	3.03000	0.09000	0.35800
Non-PCR VOCs		-	-	0.00810	0.23000
PCR VOCs		0.36000	3.03000	0.08190	0.02960

[a] Emission factors from US EPA FIRE Database, version 6.24, 2004, SCC codes 20200401 and 20300101. The diesel emission factors match AP-42, Fifth Edition, sections 3.3, and 3.4 dated 10/96. The heavy-duty diesel precursor VOC emission factor is the non-methane hydrocarbon (NMHC) factor from FIRE. Where FIRE emission factors are presented in units of lbs per 1000 gal, the conversion factors required to convert FIRE factors are 137,000 Btu/gal diesel and 126,000 Btu/gal Mogas.

Where PM10 and PM2.5 "primary" (condensible + filterable) emission factors were available in FIRE, the primary emission factor was used. In the case of NG/Propane, the use of primary factors for PM10 and PM2.5 makes those factors higher than the total PM factor, which is filterable PM only.

PCR VOC = Atmospheric Ozone Precursor VOC

[b] Diesel IC SOx emissions assume 500ppm sulfur (highway legal) diesel fuel.

WRIGHT-PATTERSON AFB - BASELINE AND PROPOSED ACTION AGE EMISSIONS

[c] No emission factors for propane IC engines are provided in AP-42 or the FIRE database. Therefore, natural gas (NG) rich-burn engine (FIRE SCC code 20200253) emission factors from US EPA FIRE Database, version 6.24, 2004, (which match AP-42 Section 3.2 dated 7/00) are used for both NG and propane-fueled reciprocating engines.

Wright-Patterson AFB 445 AGE Fuel Usage

Fiscal Year (FY) throughputs for the three 1,000 gallon underground storage tanks (UST).
Source: SMSgt Aaron Mouser (445 AMXS/CCF). April 2, 2004.

1998			**2001**		
#1	4,520	Gasoline	#1	2,468	Gasoline
#2	37,554	JP-8	#2	29,430	JP-8
#3	10,751	Diesel	#3	12,546	JP-8/Diesel
	52,825			44,444	
1999			**2002**		
#1	4,831	Gasoline	#1	246	Gasoline
#2	36,523	JP-8	#2	14,274	JP-8
#3	10,632	Diesel	#3	16,983	JP-8
	51,986			31,503	
2000			**2003**		
#1	5,044	Gasoline	#1	12,640	JP-8
#2	36,818	JP-8	#2	19,092	JP-8
#3	11,856	Diesel	#3	18,727	JP-8
	53,718			50,459	

Average Historical AGE Fuel Usage: **47,489 gallons**

Because the number of supported aircraft will be reduced from 16 C-141s to 11 C-5s, (14 PAAs + 2 BAI to 10 PAA + 1 BAI) and the use of AGE is generally proportional to the number of aircraft, the fuel consumption by AGE is expected to be reduced by

WRIGHT-PATTERSON AFB - BASELINE AND PROPOSED ACTION AGE EMISSIONS

approximately 30% (ref: Mr. Chuck Burger 3/30/04).

Projected Future Average AGE Fuel Usage: **33,242 gallons (approximately 70% of historical average)**

For the purpose of calculating interim-year emissions, the transition from current fuel usage to future fuel usage is assumed to track the total based aircraft each year, as estimated in the Drawdown/Rampup table (Ref: Table 2-1, DOPPA for the Wright-Patterson AFB C-141C to C-5 Conversion, January 2004) which is included in the "Airfield Operations" sheet of this workbook.

Emission Estimates for AGE

	Engine Fuel Use (gal)	Energy Use (MMBtu)[a]	Actual Criteria Pollutant Emissions (lb/year)						
			PM	PM10	PM2.5	CO	NOx	SOx	VOCs
AGE Baseline - JP-8 Fuel	47,489	6506.0	2,017	2,017	2,017	6,181	28,692	329	2,342
AGE 2005 - JP-8 Fuel	32,649	4472.9	1,387	1,387	1,387	4,249	19,725	226	1,610
AGE 2006 - JP-8 Fuel	26,713	3659.6	1,134	1,134	1,134	3,477	16,139	185	1,317
AGE 2007 and Beyond - JP-8 Fuel	29,681	4066.3	1,261	1,261	1,261	3,863	17,932	205	1,464
Net Emissions Change Expected			-756	-756	-756	-2,318	-10,759	-123	-878

[a] Energy Use (MMBtu) is estimated from the Fuel Use (gal) combined with the fuel heat contents listed in the footnote to the emission factor table.

METROPOLITAN DAYTON INTRASTATE AQCR
445th Airlift Wing Conversion from C-141C to C-5 Aircraft at Wright-Patterson AFB, OH

		NOx (tpy)		VOC (tpy)		CO (tpy)		SO2 (tpy)		PM10 (tpy)	
STATE	COUNTY	AREA SOURCE EMISSIONS	POINT SOURCE EMISSIONS	AREA SOURCE EMISSIONS	POINT SOURCE EMISSIONS	AREA SOURCE EMISSIONS	POINT SOURCE EMISSIONS	AREA SOURCE EMISSIONS	POINT SOURCE EMISSIONS	AREA SOURCE EMISSIONS	POINT SOURCE EMISSIONS
OH	Clark Co	5,836	32	7,732	304	48,291	4	515	12	8,464	11
OH	Darke Co	3,172	160	3,447	215	20,292	27	428	95	8,653	50
OH	Greene Co	5,140	3,517	5,969	120	42,324	470	512	1,388	6,776	1,011
OH	Miami Co	4,204	45	5,385	214	33,066	728	430	20	7,086	11
OH	Montgomery Co	20,013	3,885	28,656	1,008	198,882	718	2,532	6,006	14,065	138
OH	Preble Co	2,903	0	2,644	64	19,273	0	408	0	5,527	0
		41,268	7,639	53,833	1,925	362,128	1,947	4,825	7,521	50,571	1,221

METROPOLITAN DAYTON INTRASTATE AQCR TOTALS (Area and Point Sources)

NOx	VOC	CO	SO2	PM10
48,907	55,758	364,075	12,346	51,792

SOURCE:
http://www.epa.gov/air/data/nettier.html
USEPA - AirData NET Tier Report
*Net Air pollution sources (area and point) in tons per year (1999)
Site visited on February 10, 2004

Privately-Owned Vehicle Emissions Associated with the C-5 Conversion Proposed Action - Employees

As described in Section 2.2.3 of the DOPAA, proposed program manpower authorizations would be an additional 137 ART enlisted personnel. Drill Officers would decrease by 13 authorizations, and Drill Enlisted would increase by 49 authorizations, for a net increase of 173 people. This worksheet estimates the additional privately-owned vehicle commuting emissions expected to result from the Proposed Action.

In general, POV emissions tend to decline as the fleet is replaced with later-model vehicles that have been manufactured to lower emission standards. For this analysis, the impacts of POVs have been estimated for 2006, the earliest year when most of the additional Proposed Action new staff are expected to be on Base.

Step 1 Estimate the Vehicle Miles Traveled (VMT) by Vehicle Class

For this analysis, we have assumed that the commuter fleet corresponding to these additional employees will reflect the passenger vehicle fleet on the roads in the vicinity of Wright-Patterson AFB. The passenger care VMT data for Green County and Montgomery County Ohio, as compiled by U.S. EPA for traffic emissions modeling, were used.

Greene and Montgomery County Passenger Vehicle VMT Mix

VClassId	VMT	Vehicle Class	Mix
1	4,168.815	LDGV	67.72%
2	367.869	LDGT1	5.98%
3	1,224.654	LDGT2	19.89%
4	372.532	LDGT3	6.05%
24	22.185	MC	0.36%
Total (mi/day)	6,156.054		

Assumptions Used To Estimate Mileage

1.2	Riders per vehicle
20	Miles avg. commute round trip
50%	Vehicles do daytime errands/lunch
10	Miles avg. errand/lunch round trip
230	Working Days Per Year

Source for VMT Mix: National Mobile Inventory Model (NMIM) county-level database of NONROAD and MOBILE6 National Emission Inventory (NEI) 2002. ftp://ftp.epa.gov/EmisInventory/prelim2002nei/mobile/nmim_related/

POV Vehicle Miles Traveled Assumed for This Estimate

Description of Vehicle Class	Vehicle Class	POV VMT %	POV Annual Miles
Light-duty gasoline vehicles (passenger cars)	LDGV	67.72%	561,362
Light-duty gasoline trucks (SUVs, pickups GVWR 0-6000 lbs, LVW 0-3750 lbs)	LDGT1	5.98%	49,536
Light-duty gasoline trucks (GVWR 0-6000 lbs, LVW 3751-5750 lbs)	LDGT2	19.89%	164,909
Light-duty gasoline trucks (GVWR 6001-8500 lbs, ALVW 0-5750 lbs)	LDGT3	6.05%	50,164
Motorcycles	MC	0.36%	2,987
		100%	828,958

Step 2 Select the Appropriate Air Pollutant Emission Factors (grams per mile) for the POV Fleet

Emission Factors

Emission factors are taken from the U.S. EPA MOBILE5 emissions model, as compiled and published in "Air Emissions Inventory Guidance Document for Mobile Sources and Air Force Installations" Air Force Institute for Environmental Safety and Occupational Health Risk Analysis (AFIERA), July 2001.

All vehicle emissions are calculated assuming that the average commute vehicle is five years old. That is calendar year 2006 emissions estimates assume that the average vehicle in each vehicle class is a 2001 model.

Note that PM10 emission factors include both exhaust and "fugitive" emissions (paved road, brake & tire dust, etc.).

Emission Factors in g/mi from MOBILE5 Tables for 2001 Model Year Vehicles in CY2006.

	POV Low Altitude g/mi - 2006				
	NOx	VOC	CO	SO2	PM10
LDGV	1.0	1.0	14.6	0.072	0.71
LDGT1	1.1	1.2	16.2	0.096	1.08
LDGT2	1.1	1.2	16.2	0.096	1.08
LDGT3	1.2	1.2	16.9	0.098	2.58
MC	0.9	4.7	22.1	0.032	0.08

Reference: Tables 4-2 through 4-53, (AF IERA, July 2001)
Notes:
LDGT1 and LDGT2 emission factors shown above were taken from AF IERA LDGT1 (0-6000 lbs) emission factors
LDGT3 emission factors shown above were taken from AF IERA LDGT2 (6001-8500 lbs) emission factors

Step 3 Multiply the Emission Factors Times the Annual Vehicle Miles Traveled for Each Vehicle Class
(and convert from grams to tons)

	POV Emissions by Vehicle Class for 173 Employees - CY2006 & Beyond				
	NOx	VOC	CO	SO2	PM10
LDGV	0.619	0.619	9.034	0.045	0.439
LDGT1	0.060	0.066	0.885	0.005	0.059
LDGT2	0.200	0.218	2.945	0.017	0.196
LDGT3	0.066	0.066	0.934	0.005	0.143
MC	0.003	0.015	0.073	0.000	0.000
Total	**0.948**	**0.984**	**13.87**	**0.073**	**0.838**

The ramp-up from current conditions to the Proposed Action net emissions increase shown above will be assumed to occur in 2005.

Privately-Owned Vehicle Emissions From Construction Worker Commutes Associated with the C-5 Conversion Proposed Action - Construction Workers

The average daily number of construction workers on each worksite will depend on the area under construction, the required completion schedule, and the nature of the construction activity. For example construction or renovation of a flight simulator facility requires a large number of specialized workers (40-60 people per day). Construction of a hangar ten times as large as the flight simulator facility will require only about the same number of people on an average day. Construction of operations and training buildings fall about midway between flight simulators and aircraft hangars, with regard to labor requirements per square foot constructed.

The following annual average construction worker counts have been assumed for this analysis:

2005	80	workers
2006	170	workers
2007	40	workers

The average construction worker commute distance has been assumed to be 30 miles each way, as opposed to 20 miles each way for Base employees. Some specialized construction workers will come from greater distances, but many of these workers will stay at nearby motels during the week, and those that commute from large distances will be traveling outside the Dayton Metro area, where vehicle emissions will not contribute to pollution in the non-attainment area.

The vehicle fleet used by the construction workers is expected to include more pickups and fewer SUVs than employee fleet, but this will have little impact on fleet average emission rates, so the vehicle class mix used here will match the mix used for employee POV estimates.

Construction workers are more likely to rideshare (in company-owned crewcab pickups) than employees. However, ridesharing is difficult to predict, so this estimate will assume 1.2 riders per vehicle, as was done for the employee POV estimates.

Construction worker counts will be unaffected by vacation and 'days off' for other reasons, but some days will be lost due to adverse weather, so the working days per year is estimated to be 230, as was done for the construction equipment emission estimates.

Step 1 Estimate the Vehicle Miles Traveled (VMT) by Vehicle Class

For this analysis, we have assumed that the commuter fleet corresponding to the construction workers will reflect the passenger vehicle fleet on the roads in the vicinity of Wright-Patterson AFB. The passenger care VMT data for Green County and Montgomery County Ohio, as compiled by U.S. EPA for traffic emissions modeling, were used.

Greene and Montgomery County Passenger Vehicle VMT Mix

VClassId	VMT	Vehicle Class	Mix
1	4,168.815	LDGV	67.72%
2	367.869	LDGT1	5.98%
3	1,224.654	LDGT2	19.89%
4	372.532	LDGT3	6.05%
24	22.185	MC	0.36%
Total (mi/day)	6,156.054		100.00%

Assumptions Used To Estimate Mileage

1.2	Riders per vehicle
30	Miles avg. commute round trip
50%	Vehicles do daytime errands/lunch
10	Miles avg. errand/lunch round trip
230	Working Days Per Year

Source for VMT Mix: National Mobile Inventory Model (NMIM) county-level database of NONROAD and MOBILE6 National Emission Inventory (NEI) 2002. ftp://ftp.epa.gov/EmisInventory/prelim2002nei/mobile/nmim_related/

POV Vehicle Miles Traveled Assumed for This Estimate

Description of Vehicle Class	Vehicle Class	2005 Annual Miles	2006 Annual Miles	2007 Annual Miles
Light-duty gasoline vehicles (passenger cars)	LDGV	363,425	772,278	181,713

Light-duty gasoline trucks (SUV/pickups GVWR 0-6000 lbs, LVW 0-3750 lbs)	LDGT1	32,070	68,148	16,035
Light-duty gasoline trucks (GVWR 0-6000 lbs, LVW 3751-5750 lbs)	LDGT2	106,762	226,869	53,381
Light-duty gasoline trucks (GVWR 6001-8500 lbs, ALVW 0-5750 lbs)	LDGT3	32,476	69,012	16,238
Motorcycles	MC	1,934	4,110	967
		536,667	1,140,417	268,333

Miles = (# commuters/riders per car) * (working days) * (miles/day) + (# commuters/riders per car) * (working days) * (miles/errand) * (% vehicles doing errands)

Step 2 Select the Appropriate Air Pollutant Emission Factors (grams per mile) for the POV Fleet

Emission Factors

Emission factors are taken from the U.S. EPA MOBIL5 emissions model, as compiled and published in "Air Emissions Inventory Guidance Document for Mobile Sources and Air Force Installations" Air Force Institute for Environmental Safety and Occupational Health Risk Analysis (AFIERA), July 2001.

All vehicle emissions are calculated assuming that the average commute vehicle is five years old. That is calendar year 2006 emissions estimates assume that the average vehicle in each vehicle class is a 2001 model.

Note that PM10 emission factors include both exhaust and "fugitive" emissions (paved road, brake & tire dust, etc.).

Emission Factors in g/mi from MOBILE5 Tables for 2001 Model Year Vehicles in CY2006.

	POV Low Altitude g/mi - 2006				
	NOx	VOC	CO	SO2	PM10
LDGV	1.0	1.0	14.6	0.072	0.71
LDGT1	1.1	1.2	16.2	0.096	1.08
LDGT2	1.1	1.2	16.2	0.096	1.08
LDGT3	1.2	1.2	16.9	0.098	2.58
MC	0.9	4.7	22.1	0.032	0.08

Reference: Tables 4-2 through 4-53, (AF IERA, July 2001)
Notes:
LDGT1 and LDGT2 emission factors shown above were taken from AF IERA LDGT1 (0-6000 lbs) emission factors
LDGT3 emission factors shown above were taken from AF IERA LDGT2 (6001-8500 lbs) emission factors

Step 3 Multiply the Emission Factors Times the Annual Vehicle Miles Traveled for Each Vehicle Class
(and convert from grams to tons)

	Construction Commute Emissions by Vehicle Class- 2005				
	NOx	VOC	CO	SO2	PM10
LDGV	0.401	0.401	5.849	0.029	0.284
LDGT1	0.039	0.042	0.573	0.003	0.038
LDGT2	0.129	0.141	1.906	0.011	0.127
LDGT3	0.043	0.043	0.605	0.004	0.092
MC	0.002	0.010	0.047	0.000	0.000
Total	**0.614**	**0.637**	**8.98**	**0.047**	**0.542**

	Construction Commute Emissions by Vehicle Class- 2006				
	NOx	VOC	CO	SO2	PM10
LDGV	0.851	0.851	12.429	0.061	0.604
LDGT1	0.083	0.090	1.217	0.007	0.081
LDGT2	0.275	0.300	4.051	0.024	0.270
LDGT3	0.091	0.091	1.286	0.007	0.196
MC	0.004	0.021	0.100	0.000	0.000
Total	**1.304**	**1.354**	**19.08**	**0.100**	**1.152**

	Construction Commute Emissions by Vehicle Class- 2007				
	NOx	VOC	CO	SO2	PM10
LDGV	0.200	0.200	2.924	0.014	0.142
LDGT1	0.019	0.021	0.286	0.002	0.019
LDGT2	0.065	0.071	0.953	0.006	0.064
LDGT3	0.021	0.021	0.302	0.002	0.046
MC	0.001	0.005	0.024	0.000	0.000
Total	**0.307**	**0.319**	**4.49**	**0.024**	**0.271**

WRIGHT-PATTERSON AFB AFRC - 2003 GOVERNMENT-OWNED VEHICLES - ON-ROAD

Light-Duty Gasoline-Fueled Vehicles (LDGV)			2003 Mileage Accrued
Assumed Average Model Year		2000	
2003 Total Accumulated Mileage		-	11,165

Light-Duty Gasoline-Fueled Trucks (LDGT1) GVW 6000 lbs or less			2003 Mileage Accrued
Assumed Average Model Year		1995	
2003 Total Accumulated Mileage		-	68,008

Light-Duty Gasoline-Fueled Trucks (LDGT2) GVW 6000 - 8500 lbs			2003 Mileage Accrued
Assumed Average Model Year		1989	
2003 Total Accumulated Mileage		-	14,828

Light-Duty Diesel-Fueled Trucks (LDDT)			2003 Mileage Accrued
Assumed Average Model Year		1998	
2003 Total Accumulated Mileage		-	74,154

Heavy-Duty Diesel Vehicles (HDDV)			2003 Mileage Accrued
Assumed Average Model Year		1990	
2003 Total Accumulated Mileage		-	1,148

Compressed Natural Gas-Fueled Gasoline-Fueled Trucks (LDGT1) GVW 6000 lbs or less			2003 Mileage Accrued
Assumed Average Model Year			
2003 Total Accumulated Mileage		-	0

Compressed Natural Gas-Fueled Gasoline-Fueled Trucks (LDGT2) GVW 6000 - 8500 lbs			2003 Mileage Accrued
Assumed Average Model Year			
2003 Total Accumulated Mileage		-	0

POC for Off-Road Government-Owned Vehicles Besser Jason A TSgt 445 MXS/LGMAE Jason.Besser@wpafb.af.mil

SMSgt Aaron Mouser 257-5996 3/29/04

SMSgt Mouser pointed out that the GOVs are primarily used by Maintenance staff, and maintenance staff is expected to grow about 10% to support the C-5s. Nearly all the new positions being added are maintenance. Therefore, he would expect about a 10% increase in the use of Maintenance vehicles but not much increase in the use of Ops vehicles. The fleet should look about the same. They will have to change out the de-icing trucks and the Mark lift for units with higher reach, and they will likely add a pickup or two. It takes a lot longer to de-ice a C-5, but there will be fewer of them, so that fuel use for the deicer trucks will only increase a little.

TSgt Besser at 257-4632 is the Fleet Maintenance Supervisor.

WRIGHT-PATTERSON AFB AFRC - 2003 GOVERNMENT-OWNED VEHICLES - ON-ROAD

These emission factors are average emission factors compiled by AF-IERA for use in base-wide air emission inventories. It is possible to refine these emission factors by generating locally-specific emission factors to reflect state and local vehicle inspections (Smog checks), rule effectiveness, rule penetration, and local roadway and speed data. However for the purposes of this inventory, average factors, applicable to all AFRC bases, are used.

Emission Factors for Calendar Year 2003 (current emissions) for Government-Owned Vehicle

		Emission Factors[a] (grams per mile)						
Vehicle Class	Model Year	PM	PM_{10}	$PM_{2.5}$	CO	NOx	SOx	VOCs
LDGV	1999	3.6	0.71	0.20	10.2	0.7	0.07	0.6
LDGV	2000	3.6	0.71	0.20	8.3	0.6	0.07	0.5
LDGV	2001	3.6	0.71	0.20	6.2	0.4	0.07	0.4
LDGT1	1995	5.5	1.08	0.29	29.6	1.9	0.10	2.7
LDGT1	1996	5.5	1.08	0.29	25.3	1.6	0.10	2.2
LDGT1	1997	5.5	1.08	0.29	20.8	1.3	0.10	1.7
LDGT2	1989	13.4	2.58	0.66	53.8	3.8	0.10	5.3
LDGT2	1990	13.4	2.58	0.66	50.4	3.4	0.10	5.0
LDGT2	1991	13.4	2.58	0.66	47.0	3.2	0.10	4.6
LDDT	1998	7.8	1.59	0.48	1.7	1.3	0.16	0.7
LDDT	1999	7.8	1.59	0.48	1.6	1.2	0.16	0.7
LDDT	2000	7.8	1.59	0.48	1.5	1.2	0.16	0.6
HDDV	1990	40.3	7.73	2.01	12.4	9.9	0.51	2.1
HDDV	1991	40.3	7.73	2.01	12.1	8.2	0.51	2.0
HDDV	1992	40.3	7.73	2.01	12.0	8.2	0.51	2.0

Emission factors from Section 4 of "Air Emissions Inventory Guidance Document for Mobile Sources at Air Force Installations" AF IERA, Brooks Air Force Base TX, January 2002. Tables 4-2 through 4-50

Particulate emission factors include exhaust, brake wear, tire wear, and paved road dust.

WRIGHT-PATTERSON AFB AFRC - 2003 GOVERNMENT-OWNED VEHICLES - ON-ROAD

Vehicle Class	Avg Model Yr	Annual Miles	Actual Criteria Pollutant Emissions (lb/year)						
			PM	PM10	PM2.5	CO	NOx	SOx	VOCs
Light-Duty Gasoline-Fueled Vehicles (LDGV)	2000	11,165	89	17	5	204	15	2	12
Light-Duty Gasoline-Fueled Trucks (LDGT1) GVW 6000 lbs or less	1995	68,008	829	162	43	4,438	285	14	405
Light-Duty Gasoline-Fueled Trucks (LDGT2) GVW 6000 - 8500 lbs	1989	14,828	439	84	22	1,759	124	3	173
Light-Duty Diesel-Fueled Trucks (LDDT)	1998	74,154	1,275	260	78	278	216	26	114
Heavy-Duty Diesel Vehicles (HDDV)	1990	1,148	102	20	5	31	25	1	5
Compressed Natural Gas Fueled Vehicles									
Total			**2,734**	**543**	**154**	**6,710**	**665**	**46**	**710**
TPY			**1.37**	**0.27**	**0.08**	**3.36**	**0.33**	**0.02**	**0.36**

SMSgt Aaron Mouser 257-5996 3/29/04
SMSgt Mouser pointed out that the GOVs are primarily used by Maintenance staff, and maintenance staff is expected to grow about 10% to support the C-5s. Nearly all the new positions being added are maintenance. Therefore, he would expect about a 10% increase in the use of Maintenance vehicles For this analysis, we will assume this 10% increase takes place in CY2006 and sustains for all future years.

Net Emissions Change for On-Road GOV Under the Proposed Action (TPY) - 2006 and Beyond

	PM	PM10	PM2.5	CO	NOx	SOx	VOCs
All WPAFB AFRC-Operated On-Road GOV	0.14	0.03	0.01	0.34	0.03	0.00	0.04

WRIGHT-PATTERSON AFB AFRC Equipment - 2003 GOVERNMENT-OWNED OFF-ROAD EQUIPMENT

Mgmt. Code	Description	Emission Factor Equipment Type	Reg. No.	2003 Annual Use (hr)	Typ. Eng. Size (hp)	Typical Load[1] (%)	Fuel Type
	10K FKLFT	Forklifts	92E0308	273	83	30%	BioDiesel
	6K FKLFT	Forklifts	89E294	27	83	30%	BioDiesel
	MB-2 TUG	Aircraft Support Equipment	82L0296	45	137	51%	BioDiesel
	MB-2 TUG	Aircraft Support Equipment	85L1022	251	137	51%	BioDiesel
	MB-2 TUG	Aircraft Support Equipment	85L1023	137	137	51%	BioDiesel
	WHSE TUG	General Industrial Equip.	92E1397	40	60	51%	BioDiesel
	DEICER	Off-Highway Trucks	86W19	355	489	57%	BioDiesel
	DEICER	Off-Highway Trucks	86W20	270	489	57%	BioDiesel
	4K FKLFT	Forklifts	86E0119	76	83	30%	BioDiesel
	CR WHS GAS	CNG Terminal Tractor	95E681	49	60	51%	CNG
	TUG	General Industrial Equip.	90C393	626	60	51%	BioDiesel
	TUG	General Industrial Equip.	90C464	568	60	51%	BioDiesel
	TUG	General Industrial Equip.	90C467	575	60	51%	BioDiesel
	WHSE TUG	CNG Terminal Tractor	90E0375	50	60	51%	CNG
	TUG	General Industrial Equip.	90C478	532	60	51%	BioDiesel
	10K FKLFT	Forklifts	92E0307	726	83	30%	BioDiesel

POC for Off-Road Government-Owned Vehicles Besser Jason A TSgt 445 MXS/LGMAE Jason.Besser@wpafb.af.mil 4/28/04
This data set did not include fire trucks, fuel trucks, or landscape maintenance equipment, which are likely maintained by other shops.

Notes:

1. Typical load value from Table 7-1 of "Air Emissions Inventory Guidance Document for Mobile Sources at Air Force Installations" AF IERA, Brooks Air Force Base TX, January 2002. Factors in AF IERA cited to "Non Road Engine and Vehicle Emission Study Report" (EPA, Nov 1991).

SMSgt Aaron Mouser 257-5996 3/29/04

SMSgt Mouser pointed out that the GOVs are primarily used by Maintenance staff, and maintenance staff is expected to grow about 10% to support the C-5s. Nearly all the new positions being added are maintenance. Therefore, he would expect about a 10% increase in the use of Maintenance vehicles but not much increase in the use of Ops vehicles. The fleet should look about the same. They will have to change out the de-icing trucks and the Mark lift for units with higher reach, and they will likely add a pickup or two. It takes a lot longer to de-ice a C-5, but there will be fewer of them, so that fuel use for the deicer trucks will only increase a little.
TSgt Besser at 257-4632 is the Fleet Maintenance Supervisor.

WRIGHT-PATTERSON AFB AFRC Equipment - 2003 GOVERNMENT-OWNED OFF-ROAD EQUI

Equipment Type	Fuel	Emission Factors[a] (g/HP-hr)						
		PM	PM_{10}	$PM_{2.5}$	CO	NO_x	SO_2	VOC
Construction Equipment								
Cranes	diesel	1.44	1.44	1.44	4.20	10.30	0.93	1.29
Off-Highway Trucks	diesel	0.80	0.80	0.80	2.80	9.60	0.89	0.86
Other Construction Equip	gasoline	0.06	0.06	0.06	198.00	4.79	0.16	6.50
Crawler Dozers/Tractor	diesel	1.15	1.15	1.15	4.80	10.30	0.85	1.29
Tractors/Loaders/Backhoes Diese	diesel	1.05	1.05	1.05	6.80	10.10	0.85	1.43
Tractors/Loaders/Backhoes	gasoline	0.06	0.06	0.06	198.00	4.79	0.16	6.50
Rubber Tired Loader	diesel	1.29	1.29	1.29	4.80	10.30	0.86	0.86
Rough Terrain Forklifts	diesel	1.60	1.60	1.60	10.00	8.00	0.93	1.70
Industrial Equipment								
Speciality Vehicle Carts	diesel	0.80	0.80	0.80	5.00	6.90	0.93	1.80
General Industrial Equip	diesel	1.60	1.60	1.60	6.06	14.00	0.93	1.60
Forklifts	diesel	1.60	1.60	1.60	6.06	14.00	0.93	1.60
Aircraft Support Equipment	diesel	1.60	1.60	1.60	6.06	14.00	0.93	1.60
Lawn Maintenance/Other Equipment								
Rear Engine Riding Mowe	diesel	0.80	0.80	0.80	5.00	6.90	1.18	1.80
CNG Industrial Equipment								
CNG Terminal Tractor	CNG	0.05	0.05	0.05	63.70	17.90	0.01	3.00

Gasoline emission factors are taken from (AF IERA 2002) Table 7-3 and correspond to 4-stroke engines.
Diesel emission factors for all units > 50 HP are taken from (AF IERA 2002) Table 7-7, which conservatively assumes that a large portion of the equipment is pre-1988 models.
Diesel emission factors for units up to 50 HP are taken from (AF IERA 2002) Table 7-6 Group 1 and assume that these units are pre-1999 models
CNG emission factors are taken from (AF IERA 2002) Table 7-4.

WRIGHT-PATTERSON AFB AFRC Equipment - 2003 GOVERNMENT-OWNED OFF-ROAD EQUIPMEN

Equipment Type	Fuel	Total Activity (HP-hr)	Actual Criteria Pollutant Emissions (lb/year)						
			PM	PM10	PM2.5	CO	NOx	SOx	VOCs
Construction Equipment									
Cranes	diesel	-	-	-	-	-	-	-	-
Off-Highway Trucks	diesel	174,206.3	307.2	307.2	307.2	1,075.3	3,686.9	341.8	331.4
Other Construction Equip.	gasoline	-	-	-	-	-	-	-	-
Crawler Dozers/Tractor	diesel	-	-	-	-	-	-	-	-
Tractors/Loaders/Backhoes Diesel	diesel	-	-	-	-	-	-	-	-
Tractors/Loaders/Backhoes	gasoline	-	-	-	-	-	-	-	-
Rubber Tired Loader	diesel	-	-	-	-	-	-	-	-
Rough Terrain Forklifts	diesel	-	-	-	-	-	-	-	-
Industrial Equipment									
Speciality Vehicle Carts	diesel	-	-	-	-	-	-	-	-
General Industrial Equip.	diesel	71,634.6	252.7	252.7	252.7	957.0	2,210.9	146.9	253.2
Forklifts	diesel	27,439.8	96.8	96.8	96.8	366.6	846.9	56.3	97.0
Aircraft Support Equipment	diesel	30,253.7	106.7	106.7	106.7	404.2	933.8	62.0	106.9
Lawn Maintenance/Other Equipment									
Rear Engine Riding Mower	diesel	-	-	-	-	-	-	-	-
CNG Industrial Equipment									
CNG Terminal Tractor	CNG	3,029.4	0.3	0.3	0.3	425.4	119.5	0.1	20.0
Total		**306,564**	**764**	**764**	**764**	**3,229**	**7,798**	**607**	**809**
TPY			**0.38**	**0.38**	**0.38**	**1.61**	**3.90**	**0.30**	**0.40**

The HP-hr for each device is calculated in the "Data Table" of this workbook as the product of:
[Annual Use (hrs)] * [Typical Load (%)] * [Engine Size (HP)] = HP-hr

These values are summed in this table according to Equipment type.

The resulting HP-hr values are multiplied by the appropriate grams/HP-hr emission factors from the "EFs & Constants Table" of this workbook, and converted to lbs in the table above.

SMSgt Aaron Mouser 257-5996 3/29/04
SMSgt Mouser pointed out that the GOVs are primarily used by Maintenance staff, and maintenance staff is expected to grow about 10% to support the C-5s. Nearly all the new positions being added are maintenance. Therefore, he would expect about a 10% increase in the use of Maintenance vehicles For this analysis, we will assume this 10% increase takes place in CY2006 and sustains for all future years.

Net Emissions Change for Off-Road GOV Under the Proposed Action (TPY) - 2006 and Beyond

	PM	PM10	PM2.5	CO	NOx	SOx	VOCs
All WPAFB AFRC-Operated Off-Road GOV	0.04	0.04	0.04	0.16	0.39	0.03	0.04

APPENDIX D

OHIO STATE HISTORIC PRESERVATION OFFICE CORRESPONDENCE

January 20, 2004

Ms. Rachel M. Tooker
State Historic Preservation Officer
Ohio Historical Society
1982 Velma Avenue
Columbus, Oh 43211

Dear Ms. Tooker:

The Air Force Reserve Command is preparing an Environmental Assessment (EA) for the 445th Airlift Wing Conversion from C-141C to C-5 Aircraft at Wright-Patterson Air Force Base, Ohio. engineering-environmental Management, Inc. (e^2M) has been contracted by the Air Force Reserve Command to assist in the preparation of the EA. The Description of Proposed Action and Alternatives (DOPAA), which forms the basis for the analysis to be conducted within the EA, is included with this correspondence as Attachment 1.

The environmental impact analysis process for this proposal is being conducted by the Air Force Reserve Command in accordance with the Council on Environmental Quality guidelines pursuant to the requirements of the National Environmental Policy Act of 1969. In accordance with Executive Order 12372, *Intergovernmental Review of Federal Programs*, we request your participation by reviewing the attached DOPAA and solicit your comments concerning the proposal and any potential environmental consequences. Please provide written comments or information regarding the action at your earliest convenience but no later than February 20, 2004. Also enclosed is a listing of the Federal, state, and local agencies that have been contacted (see Attachment 2). If there are any additional agencies that you feel should review and comment on the proposal, please include them in your distribution of this letter and the attached materials.

Please address questions concerning or comments on the proposal to Mr. Brian Hoppy at e^2M. I can be reached at (610) 649-8064 until January 30, 2004 and at (610) 949-9699 starting February 2, 2004. Please forward your written comments to Mr. Hoppy, in care of e^2M, Inc., 3949 Pender Drive, Suite 120, Fairfax, Virginia, 22030. Thank you for your assistance.

Sincerely,
engineering-environmental Management, Inc.

Brian Hoppy
Program Manager

Attachments:
1. Description of Proposed Action and Alternatives (DOPAA)
2. Distribution List

Ohio Historic Preservation Office

567 East Hudson Street
Columbus, Ohio 43211-1030
614/ 298-2000 Fax: 614/ 298-2037

Visit us at www.ohiohistory.org

OHIO HISTORICAL SOCIETY
SINCE 1885

March 15, 2004

Brian Hoppy, Program Manager
engineering-environmental Management, Inc.
3949 Pender Drive
Suite 120
Fairfax, Virginia 22030

Re: Environmental Assessment for the 445th Airlift Wing Conversion from C-141C to C-5 Aircraft at Wright-Patterson Air Force Base, Ohio

Dear Mr. Hoppy:

This is in response to correspondence, received on January 27, 2004, regarding the above referenced project. My comments are made pursuant to Section 106 of the National Historic Preservation Act of 1966, as amended, and the associated regulations at 36 CFR Part 800.

To fulfill its obligations under the National Environmental Policy Act of 1969 (NEPA), the Air Force has contracted with engineering-environmental Management, Inc. to assist in the preparation of an Environmental Assessment for the conversion of the 445th Airlift Wing from C-141C to C-5 aircraft at Wright-Patterson Air Force Base, Ohio. engineering-environmental Management, Inc. has provided the Ohio Historic Preservation Office with a Description of the Proposed Action and Alternatives (DOPAA) and seeks our comments "concerning the proposal and any potential environmental consequences".

Please note that, in addition to its NEPA responsibilities, the Air Force must fulfill its obligations under Section 106 of the National Historic Preservation Act for this undertaking. Whereas NEPA provides a level of consideration to a wide array of environmental resources, Section 106 considers only the effects of federal undertakings on historic properties. Therefore, we offer comments pursuant to Section 106 and its associated regulations as opposed to NEPA.

36 CFR Part 800 provides a framework for the Section 106 review process. The federal agency, in consultation with the State Historic Preservation Office and other consulting parties, is responsible for establishing an Area of Potential Effects (APE) for the undertaking, identifying historic properties within the APE, and assessing the effects of the project on those properties. The federal agency is also responsible for preparing all of the documentation required by 36 CFR Section 800.11 to assist consulting parties in their review of the project and to document its fulfillment of the various responsibilities assigned to it by 36 CFR Part 800. We recommend that engineering-environmental Management, Inc. seek the assistance of Jan Ferguson, Cultural Resources Program Manager at Wright-Patterson Air Force Base, in preparing the documentation required by 36 CFR Section 800.11.

We are able to offer comments on one project associated with the 445th Airlift Wing conversion based on the information provided in the DOPAA and in our files. Project 8 will involve substantial alteration of Building 152, a property that may be eligible for listing in the National Register of Historic Places under Criterion A for its association with the Cold War. The existing C-141 flight simulator will be removed from Building 152 and a new C-5 flight simulator will be installed. In addition, the project will include the construction of a 4,004 square foot addition and various alterations to walls, ceilings, etc. within the building. While the DOPAA does not provide specific details regarding Project 8, we are nonetheless concerned that the proposed changes may not conform to the *Secretary of the Interior's Standards for Rehabilitation and Guidelines for Rehabilitating Historic Buildings* and may result in an adverse effect on this historic property.

We will offer additional comments when we receive the documentation required by 36 CFR Part 800.11. If you have any questions, please contact me by phone at (614) 298-2000 or by e-mail at jcook@ohiohistory.org. Thank you for your cooperation.

Sincerely,

Justin M. Cook

Justin M. Cook, History Reviews Maanger
Resource Protection and Review

Copy: Jan Ferguson, Cultural Resources Program Manager, 88 ABW/EMO Bldg. 89, WPAFB, Ohio 45433-5332

DEPARTMENT OF THE AIR FORCE
HEADQUARTERS 88TH AIR BASE WING (AFMC)
WRIGHT-PATTERSON AIR FORCE BASE OHIO

2 April 2004

88 ABW/EMO Bldg 89
5490 Pearson Road
Wright-Patterson AFB OH 45433-5332

Mr. Mark Epstein
Department Head, Resource Protection & Review
Ohio Historic Preservation Office
567 East Hudson Street
Columbus OH 43211-1030

Dear Mr. Epstein

This letter is a follow-up to the March 15, 2004 letter sent by Mr. Justin Cook of your office to Mr. Brian Hoppy of Engineering-Environmental Management regarding the Air Force's plan to convert the 445th Airlift Wing from C-141 to C-5 aircraft at Wright-Patterson Air Force Base (WPAFB). Through this letter we are initiating consultation under Section 106 of the National Historic Preservation Act. It is our opinion that the proposed C-5 aircraft conversion will have no adverse effect on properties at Wright-Patterson Air Force Base listed on, or eligible for listing on, the National Register of Historic Places.

In accordance with 36 CFR 800.11, we are submitting the following documentation:

a. A description of the undertaking and Area of Potential Effect, with mapping;
b. A description of steps taken to identify historic properties;
c. A description of affected historic properties; and
d. A description of the undertaking's effects on historic properties, using the criteria of effect.

Description of the undertaking. The proposed action would replace the 445th Airlift Wing's 16 retiring C-141 aircraft with approximately 10 C-5 aircraft. This aircraft conversion would result in some changes in personnel (an increase of 137 people), minor changes in aircraft operations (similar to current operations), and new construction to accommodate the larger aircraft. The proposed construction activities are described in Section 2.2.2 of the attached excerpt from the preliminary draft environmental assessment for the aircraft conversion (Attachment 1). This attachment also contains mapping showing the Area of Potential Effect.

Description of steps taken to identify historic properties. WPAFB has assessed all buildings on the installation that are 50 years old or older, and has assessed buildings for exceptional significance relating to the Cold War. Your office has reviewed the information we have collected, and our two offices have reached a consensus determination of eligibility for listing on the National Register of Historic Places for facilities at WPAFB. WPAFB has also undertaken archaeological survey for prehistoric and historic-era archaeological sites, and has provided reports of those surveys to your office for review.

Description of affected historic properties. The only historic facilities within the Area of Potential Effect are Facility 34004 and Facility 30152 (locations are shown on the mapping provided with Attachment 1), both of which are Cold War facilities. Facility 34004 will not be impacted by the proposed renovations on the West Ramp portion of the airfield. Facility 30152 would be modified to replace the existing C-141 flight simulator with a new, larger C-5 flight simulator . Two other Cold War eligible facilities – 34062 and 34064 – are within a half mile of the Area of Potential Effect. Copies of the Ohio Historic Inventory forms for these four facilities are provided as Attachment 2. There are no prehistoric or historic-era archaeological sites within the Area of Potential Effect. There are several archaeological sites located within one mile, but all of these sites have been determined to be ineligible for listing on the National Register of Historic Places.

Description of the undertaking's effects on historic properties. Because there are no archaeological sites within the Area of Potential Effect, the undertaking will have no effect on significant archaeological resources at Wright-Patterson Air Force Base. With respect to historic facilities, the undertaking will have no effect on Facilities 34062 and 34064, since they are outside the Area of Potential Effect. While Facility 34004 is within the Area of Potential Effect, no work is planned anywhere near this facility, and it would not be affected by the undertaking. Facility 30152 will be affected by the undertaking. This facility is scheduled for extensive modifications to accommodate a newer and larger flight simulator for C-5 pilot training. Interior modifications would need to be made (as described in Attachment 1, pages 2-9 and 2-10) and an approximately 4,000 square foot addition would be needed. It is our intent that the modifications to Facility 30152 would be accomplished in accordance with the Secretary of Interior's standards for the treatment of historic properties, and that your office would be afforded an opportunity to review and comment on the design for these modifications to avoid adverse effects.

Based on the above and the enclosed information, it is our opinion that, in accordance with 36 CFR 800.5(b), the proposed 445th Airlift Wing conversion from C-141 to C-5 aircraft at Wright-Patterson Air Force Base will have a conditional no adverse effect upon historic properties. Please let us know whether or not you concur with this assessment. Should you or your staff require additional information, I can be reached at (937) 257-5528 or via email at Janet.Ferguson@wpafb.af.mil.

Sincerely

Jan Ferguson

JAN FERGUSON
Cultural Resources Program Manager
Operations Branch
Office of Environmental Management

Attachments
1. Excerpts from Preliminary Draft EA
2. OHI Forms for Historic Facilities

Ohio Historic Preservation Office

567 East Hudson Street
Columbus, Ohio 43211-1030
614/ 298-2000 Fax: 614/ 298-2037

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OHIO HISTORICAL SOCIETY
SINCE 1885

June 24, 2004

Jan Ferguson
Cultural Resources Program Manager
Operations Branch
Office of Environmental Management
88 ABW/EMO Bldg 89
5490 Pearson Road
Wright-Patterson Air Force Base, Ohio 45433-5332

Re: 445th Airlift Wing Conversion from C-141C to C-5 Aircraft at Wright-Patterson Air Force Base, Ohio

Dear Ms. Ferguson:

This is in response to correspondence, received on April 6, 2004, regarding the above referenced project. My comments are made pursuant to Section 106 of the National Historic Preservation Act of 1966, as amended, and the associated regulations at 36 CFR Part 800.

Thank you for providing a detailed assessment of the effects of the proposed undertaking on historic properties. The proposed 445th Airlift Wing Conversion will affect one historic property – Facility 30152. Based on your letter dated April 2, 2004, it is our understanding that plans and specification for the proposed modifications to Facility 30152 have yet to be developed. However, it is known that the existing C-141 flight simulator will be removed and a new, larger C-5 flight simulator will be installed. The Air Force intends to design the proposed modifications to Facility 30152 to ensure that they conform to the *Secretary of the Interior's Standards for Rehabilitation and Guidelines for Rehabilitating Historic Buildings.*

Based on the recommendation of my staff, I concur with your finding that the proposed project will have no adverse effect on historic properties, provided that the following condition is met:

The Air Force must submit standard project documentatiou – including plans, specifications, and photographs – for the proposed modification of Facility 30152 to the Ohio Historic Preservation Office (OHPO) for review and approval prior to the initiation of the undertaking.

If you have any questions, please contact Justin Cook, History Reviews Manager, by phone at (614) 298-2000 or by e-mail at jcook@ohiohistory.org. Thank you for your cooperation.

Sincerely,

Mark J. Epstein, Department Head
Resource Protection and Review

MJE/JMC:jc

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